
Motorcycle Service Manual

KLX300
KLX300SM

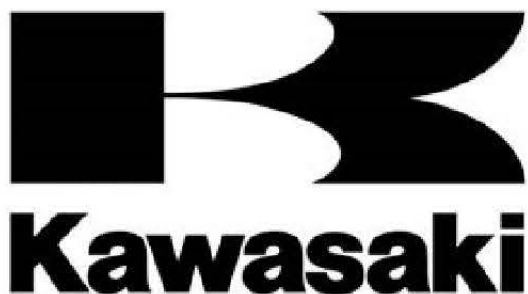


Quick Reference Guide

General Information	1
Periodic Maintenance	2
Fuel System (DFI)	3
Cooling System	4
Engine Top End	5
Clutch	6
Engine Lubrication System	7
Engine Removal/Installation	8
Crankshaft/Transmission	9
Wheels/Tires	10
Final Drive	11
Brakes	12
Suspension	13
Steering	14
Frame	15
Electrical System	16
Appendix	17

This quick reference guide will assist you in locating a desired topic or procedure.

- Bend the pages back to match the black tab of the desired chapter number with the black tab on the edge at each table of contents page.
- Refer to the sectional table of contents for the exact pages to locate the specific topic required.



KLX300D/E

Motorcycle Service Manual

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LIST OF ABBREVIATIONS

A	ampere(s)	in.	inch(es)
ABDC	after bottom dead center	KACR	Kawasaki Automatic Compression Release
AC	alternating current	km/h	kilometers per hour
Ah	ampere hour	L	liter(s)
ATDC	after top dead center	lb	pound(s)
BBDC	before bottom dead center	LED	light emitting diode
BDC	bottom dead center	m	meter(s)
BTDC	before top dead center	min	minute(s)
°C	degree(s) Celsius	mph	miles per hour
cmHg	centimeters of mercury	N	newton(s)
cu in.	cubic inch(es)	oz	ounce(s)
DC	direct current	Pa	pascal(s)
DFI	digital fuel injection	PS	horsepower(s)
DOHC	double overhead camshaft	psi	pound(s) per square inch
DOT	department of transportation	qt	quart(s)
ECU	electronic control unit	r	revolution
F	farad(s)	rpm	revolution(s) per minute
°F	degree(s) Fahrenheit	s	second(s)
ft	foot, feet	TDC	top dead center
g	gram(s)	TIR	total indicator reading
gal	gallon(s)	V	volt(s)
h	hour(s)	W	watt(s)
HP	horsepower(s)	Ω	ohm(s)
IC	integrated circuit		

COUNTRY AND AREA CODES

CAL	California	US	United States
CA	Canada		

EMISSION CONTROL INFORMATION

To protect the environment in which we all live, Kawasaki has incorporated crankcase emission (1) and exhaust emission (2) control systems in compliance with applicable regulations of the United States Environmental Protection Agency and California Air Resources Board. Additionally, Kawasaki has incorporated an evaporative emission control system (3) in compliance with applicable regulations of the California Air Resources Board on vehicles sold in California only.

1. Crankcase Emission Control System

This system eliminates the release of crankcase vapors into the atmosphere. Instead, the vapors are routed through an oil separator to the intake side of the engine. While the engine is operating, the vapors are drawn into combustion chamber, where they are burned along with the fuel and air supplied by the fuel injection system.

2. Exhaust Emission Control System

This system reduces the amount of pollutants discharged into the atmosphere by the exhaust of this motorcycle. The fuel, ignition, and exhaust systems of this motorcycle have been carefully designed and constructed to ensure an efficient engine with low exhaust pollutant levels.

3. Evaporative Emission Control System

Vapors caused by fuel evaporation in the fuel system are not vented into the atmosphere. Instead, fuel vapors are routed into the running engine to be burned, or stored in a canister when the engine is stopped.

The Clean Air Act, which is the Federal law covering motor vehicle pollution, contains what is commonly referred to as the Act's "tampering provisions."

"Sec. 203(a) The following acts and the causing thereof are prohibited.

(3)(A) for any person to remove or render inoperative any device or element of design installed on or in a motor vehicle or motor vehicle engine in compliance with regulations under this title prior to its sale and delivery to the ultimate purchaser, or for any manufacturer or dealer knowingly to remove or render inoperative any such device or element of design after such sale and delivery to the ultimate purchaser.

(3)(B) for any person engaged in the business of repairing, servicing, selling, leasing, or trading motor vehicles or motor vehicle engines, or who operates a fleet of motor vehicles knowingly to remove or render inoperative any device or element of design installed on or in a motor vehicle or motor vehicle engine in compliance with regulations under this title following its sale and delivery to the ultimate purchaser..."

NOTE

○The phrase "remove or render inoperative any device or element of design" has been generally interpreted as follows.

1. Tampering does not include the temporary removal or rendering inoperative of devices or elements of design in order to perform maintenance.
2. Tampering could include.
 - a. Maladjustment of vehicle components such that the emission standards are exceeded.
 - b. Use of replacement parts or accessories which adversely affect the performance or durability of the motorcycle.
 - c. Addition of components or accessories that result in the vehicle exceeding the standards.
 - d. Permanently removing, disconnecting, or rendering inoperative any component or element of design of the emission control systems.

WE RECOMMEND THAT ALL DEALERS OBSERVE THESE PROVISIONS OF FEDERAL LAW, THE VIOLATION OF WHICH IS PUNISHABLE BY CIVIL PENALTIES NOT EXCEEDING \$10 000 PER VIOLATION.

TAMPERING WITH NOISE CONTROL SYSTEM PROHIBITED

Federal law prohibits the following acts or the causing thereof. (1) The removal or rendering inoperative by any person other than for purposes of maintenance, repair, or replacement, of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use, or (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

Among those acts presumed to constitute tampering are the acts listed below.

- Replacement of the original exhaust system or muffler with a component not in compliance with Federal regulations.
- Removal of the muffler(s) or any internal portion of the muffler(s).
- Removal of the air box or air box cover.
- Modifications to the muffler(s) or air intake system by cutting, drilling, or other means if such modifications result in increased noise levels.

Foreword

(About this manual)

This service manual explains maintenance procedures for removing, installing, disassembling, assembling, and adjusting, as necessary, including periodic inspection and maintenance of major parts of recording models.

(Disclaimer)

1. This book does not describe all the matters concerning maintenance. This book is made for people who have basic skills and knowledge on maintenance of Kawasaki products (authorized Kawasaki dealers or other repairers). So those who do not have these skills and knowledge do not do maintenance or inspection with this manual. Skill shortage and lack of knowledge may cause maintenance troubles, parts breakage, etc.
2. All information contained in this publication is based on the latest product information available at the time of publication. No liability can be accepted for any inaccuracies or omissions in this publication, although every possible care has been taken to make it as complete and accurate as possible.
3. Illustrations and photographs in this publication are intended for reference use only and may not depict actual model component parts.
4. The right is reserved to make changes at any time without prior notice and without incurring an obligation to make such changes to products manufactured previously. Please accept beforehand that the description content, illustration, photographs etc. may differ from actual vehicle due to vehicle specification change.
5. The content of the description may be changed without prior notice for vehicle specification change etc.

How to Use This Manual

In this manual, the product is divided into its major systems and these systems make up the manual's chapters. The Quick Reference Guide shows you all of the product's system and assists in locating their chapters. Each chapter in turn has its own comprehensive Table of Contents.

For example, if you want ignition coil information, use the Quick Reference Guide to locate the Electrical System chapter. Then, use the Table of Contents on the first page of the chapter to find the Ignition Coil section.

Whenever you see symbols, heed their instructions! Always follow safe operating and maintenance practices.

DANGER

DANGER indicates a hazardous situation which, if not avoided, will result in death or serious injury.

WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

NOTICE

NOTICE is used to address practices not related to personal injury.

This manual contains four more symbols which will help you distinguish different types of information.

NOTE

○*NOTE indicates information that may help or guide you in the operation or service of the vehicle.*

- Indicates a procedural step or work to be done.
- Indicates a procedural sub-step or how to do the work of the procedural step it follows. It also precedes the text of a NOTE.
- ★ Indicates a conditional step or what action to take based on the results of the test or inspection in the procedural step or sub-step it follows.

In most chapters an exploded view illustration of the system components follows the Table of Contents. In these illustrations you will find the instructions indicating which parts require specified tightening torque, oil, grease or a locking agent during assembly.

General Information

Table of Contents

Before Servicing	1-2
Model Identification.....	1-7
General Specifications.....	1-9
Unit Conversion Table	1-13

1-2 GENERAL INFORMATION

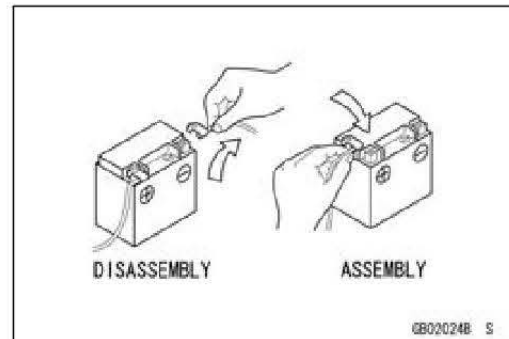
Before Servicing

Before starting to perform an inspection service or carry out a disassembly and reassembly operation on a motorcycle, read the precautions given below. To facilitate actual operations, notes, illustrations, photographs, cautions, and detailed descriptions have been included in each chapter wherever necessary. This section explains the items that require particular attention during the removal and installation or disassembly and reassembly of general parts.

Especially note the following:

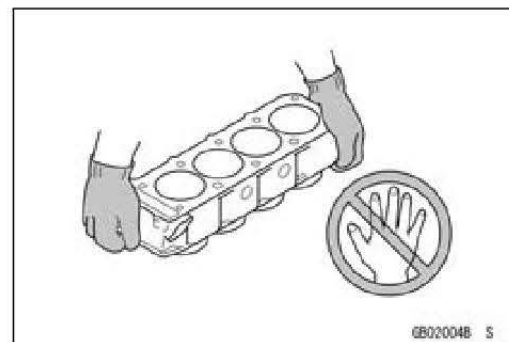
Battery Ground

Before completing any service on the motorcycle, disconnect the battery cables from the battery to prevent the engine from accidentally turning over. Disconnect the ground cable (–) first and then the positive (+). When completed with the service, first connect the positive (+) cable to the positive (+) terminal of the battery then the negative (–) cable to the negative terminal.



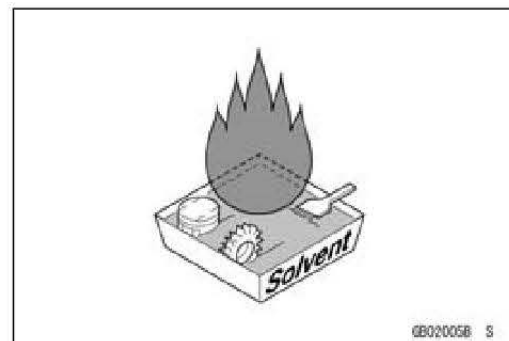
Edges of Parts

Lift large or heavy parts wearing gloves to prevent injury from possible sharp edges on the parts.



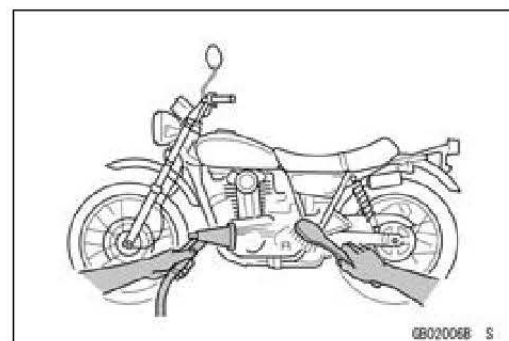
Solvent

Use a high flash-point solvent when cleaning parts. High flash-point solvent should be used according to directions of the solvent manufacturer.



Cleaning vehicle before disassembly

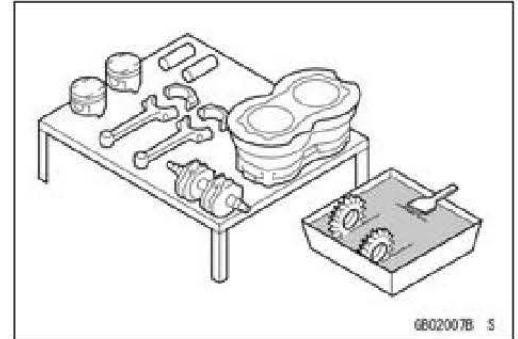
Clean the vehicle thoroughly before disassembly. Dirt or other foreign materials entering into sealed areas during vehicle disassembly can cause excessive wear and decrease performance of the vehicle.



Before Servicing

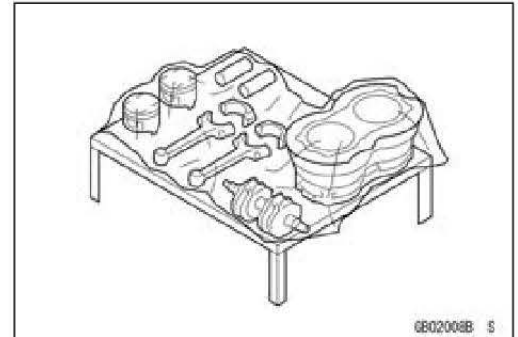
Arrangement and Cleaning of Removed Parts

Disassembled parts are easy to confuse. Arrange the parts according to the order the parts were disassembled and clean the parts in order prior to assembly.



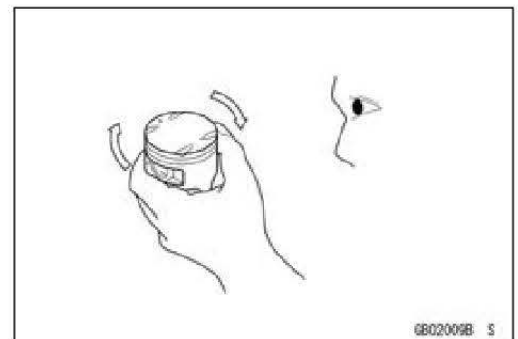
Storage of Removed Parts

After all the parts including subassembly parts have been cleaned, store the parts in a clean area. Put a clean cloth or plastic sheet over the parts to protect from any foreign materials that may collect before re-assembly.



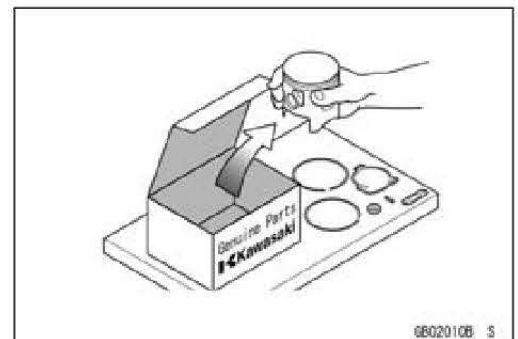
Inspection

Reuse of worn or damaged parts may lead to serious accident. Visually inspect removed parts for corrosion, discoloration, or other damage. Refer to the appropriate sections of this manual for service limits on individual parts. Replace the parts if any damage has been found or if the part is beyond its service limit.



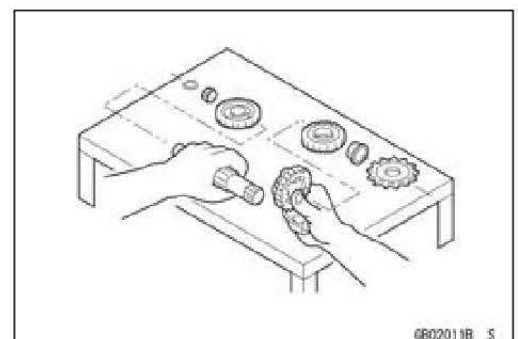
Replacement Parts

Replacement Parts must be KAWASAKI genuine or recommended by KAWASAKI. Gaskets, O-rings, Oil seals, Grease seals, circlips, cotter pins or self-locking nuts must be replaced with new ones whenever disassembled.



Assembly Order

In most cases assembly order is the reverse of disassembly, however, if assembly order is provided in this Service Manual, follow the procedures given.

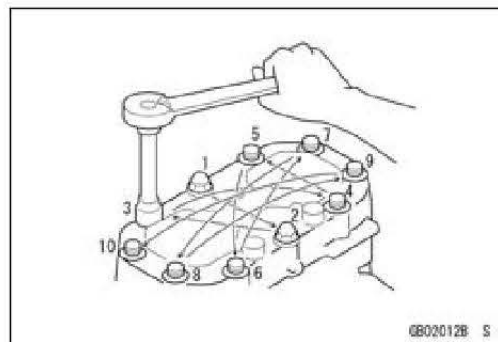


1-4 GENERAL INFORMATION

Before Servicing

Tightening Sequence

Generally, when installing a part with several bolts, nuts, or screws, start them all in their holes and tighten them to a snug fit. Then tighten them according to the specified sequence to prevent case warpage or deformation which can lead to malfunction. Conversely when loosening the bolts, nuts, or screws, first loosen all of them by about a quarter turn and then remove them. If the specified tightening sequence is not indicated, tighten the fasteners alternating diagonally.

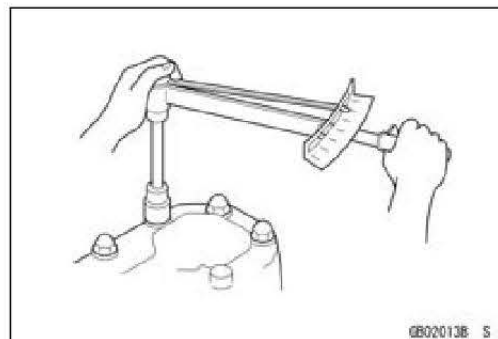


Tightening Torque

Incorrect torque applied to a bolt, nut, or screw may lead to serious damage. Tighten fasteners to the specified torque using a good quality torque wrench.

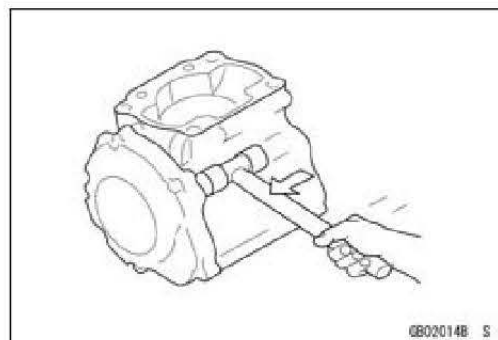
Often, the tightening sequence is followed twice-initial tightening and final tightening with torque wrench.

All of the tightening torque values are for use with dry, solvent - cleaned threads unless otherwise indicated. If a fastener which should have dry, clean threads gets contaminated with lubricant, etc., applying even the specified torque could damage it.



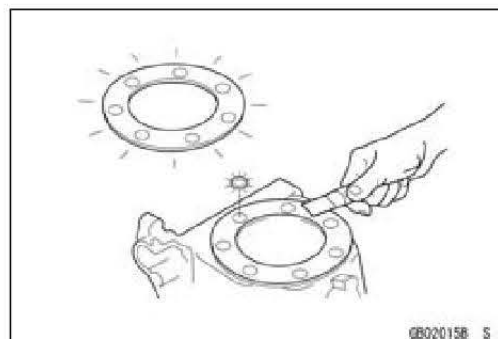
Force

Use common sense during disassembly and assembly, excessive force can cause expensive or hard to repair damage. When necessary, remove screws that have a non-permanent locking agent applied using an impact driver. Use a plastic-faced mallet whenever tapping is necessary.



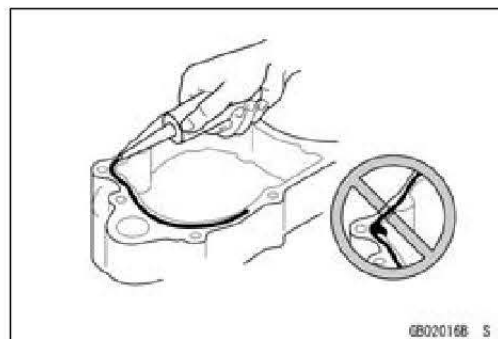
Gasket, O-ring

Hardening, shrinkage, or damage of both gaskets and O-rings after disassembly can reduce sealing performance. Remove old gaskets and clean the sealing surfaces thoroughly so that no gasket material or other material remains. Install new gaskets and replace the used O-rings when re-assembling.



Liquid Gasket, Non-permanent Locking Agent

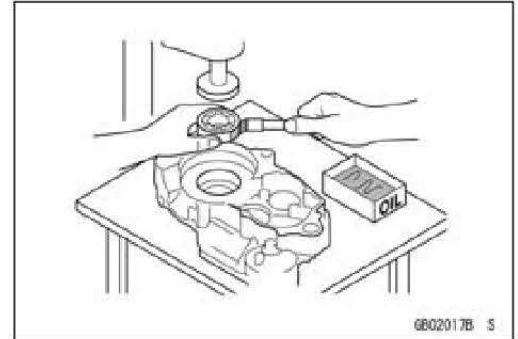
For applications that require Liquid Gasket or a Non-permanent Locking agent, clean the surfaces so that no oil residue remains before applying liquid gasket or non-permanent locking agent. Do not apply them excessively. Excessive application can clog oil passages and cause serious damage.



Before Servicing

Press

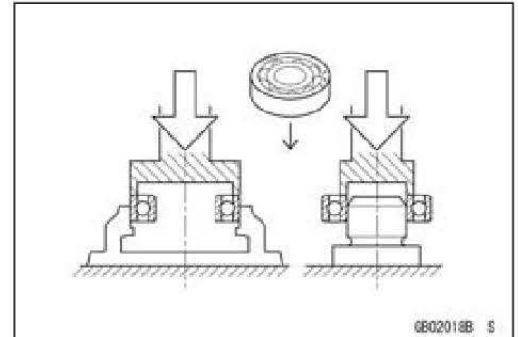
For items such as bearings or oil seals that must be pressed into place, apply small amount of oil to the contact area. Be sure to maintain proper alignment and use smooth movements when installing.



Ball Bearing and Needle Bearing

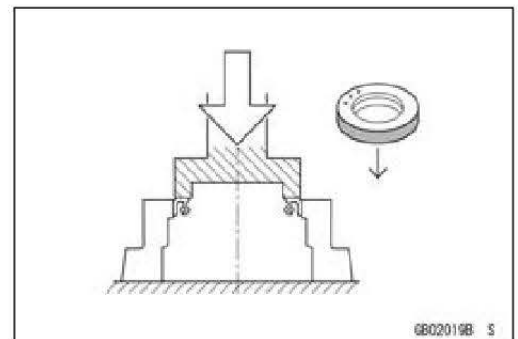
Do not remove pressed ball or needle unless removal is absolutely necessary. Replace with new ones whenever removed. Press bearings with the manufacturer and size marks facing out. Press the bearing into place by putting pressure on the correct bearing race as shown.

Pressing the incorrect race can cause pressure between the inner and outer race and result in bearing damage.

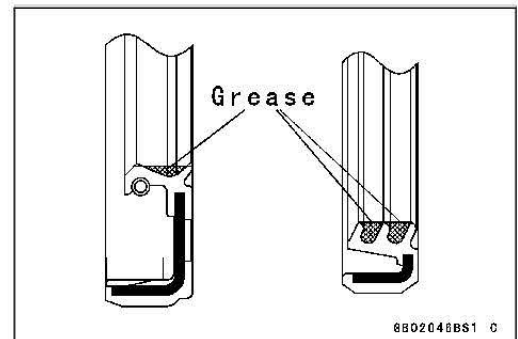


Oil Seal, Grease Seal

Do not remove pressed oil or grease seals unless removal is necessary. Replace with new ones whenever removed. Press new oil seals with manufacture and size marks facing out. Make sure the seal is aligned properly when installing.

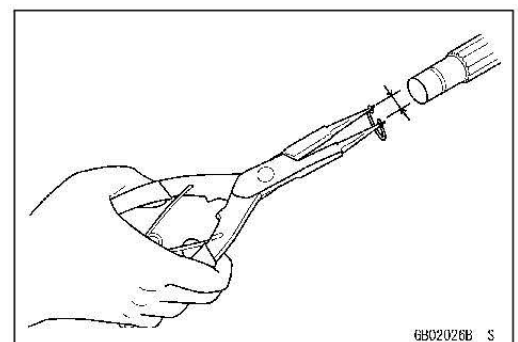


Apply specified grease to the lip of seal before installing the seal.



Circlips, Cotter Pins

Replace circlips or cotter pins that were removed with new ones. Take care not to open the clip excessively when installing to prevent deformation.

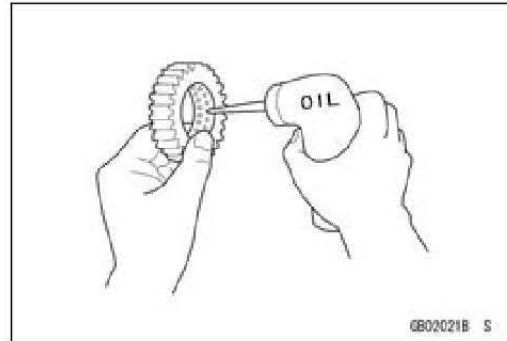


1-6 GENERAL INFORMATION

Before Servicing

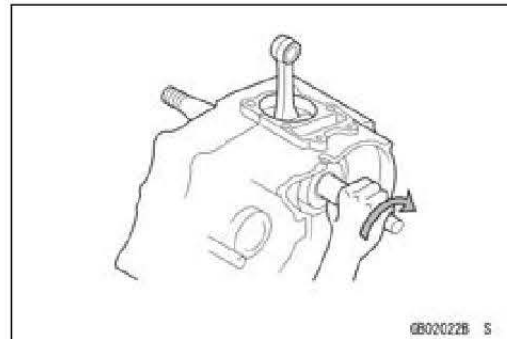
Lubrication

It is important to lubricate rotating or sliding parts during assembly to minimize wear during initial operation. Lubrication points are called out throughout this manual, apply the specific oil or grease as specified.



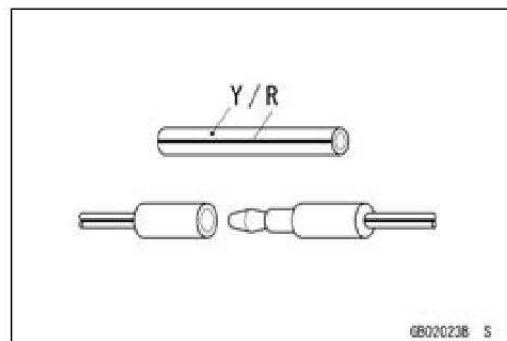
Direction of Engine Rotation

When rotating the crankshaft by hand, the free play amount of rotating direction will affect the adjustment. Rotate the crankshaft to positive direction (clockwise viewed from output side).



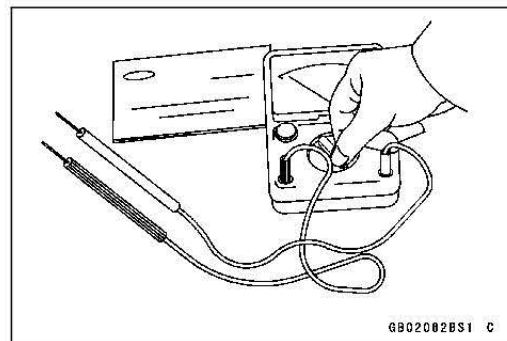
Electrical Leads

A two-color lead is identified first by the primary color and then the stripe color. Unless instructed otherwise, electrical leads must be connected to those of the same color.



Instrument

Use a meter that has enough accuracy for an accurate measurement. Read the manufacture's instructions thoroughly before using the meter. Incorrect values may lead to improper adjustments.



Handling Electronic Parts

Severe impacts to electronic parts such as the ECU, sensor, and relay can damage them. If dropped on a hard surface, replace such parts with new ones.

If a high voltage that is created by static electricity is applied to the electric parts, it could cause them to fail. To avoid this, touch a non-painted metal surface to discharge any static electricity that is accumulated on your body before inspecting or replacing electric parts.

Be careful not to touch the electrical terminals of the electronic parts. The static electricity discharged from your body could damage them or deform the electrical terminals.

Model Identification

KLX300DM Left Side View



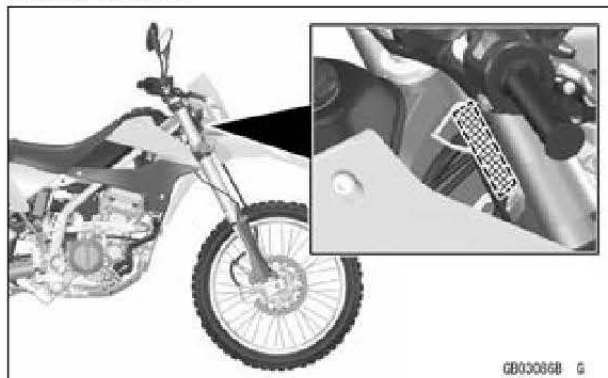
GB030097 P

KLX300DM Right Side View



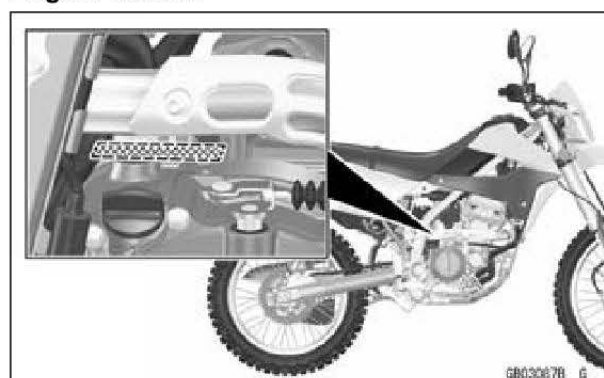
GB030098 P

Frame Number



GB030068 G

Engine Number



GB030070 G

1-8 GENERAL INFORMATION

Model Identification

KLX300EM Left Side View



6B03C099 P

KLX300EM Right Side View



6B03C100 P

General Specifications

Items	KLX300DM/EM
Dimensions	
Overall Length:	
KLX300D	2 195 mm (86.42 in.)
KLX300E	2 145 mm (84.45 in.)
Overall Width:	
KLX300D	820 mm (32.28 in.)
KLX300E	790 mm (31.10 in.)
Overall Height:	
KLX300D	1 195 mm (47.05 in.)
KLX300E	1 145 mm (45.08 in.)
Wheel Base:	
KLX300D	1 440 mm (56.69 in.)
KLX300E	1 435 mm (56.50 in.)
Ground Clearance:	
KLX300D	250 mm (9.84 in.)
KLX300E	215 mm (8.46 in.)
Seat Height:	
KLX300D	895 mm (35.2 in.)
KLX300E	860 mm (33.9 in.)
Curb Mass:	
KLX300D:	137 kg (302 lb)
Front	73 kg (161 lb)
Rear	64 kg (141 lb)
KLX300E:	138 kg (304 lb)
Front	66 kg (146 lb)
Rear	72 kg (159 lb)
Fuel Tank Capacity	7.7 L (2.0 US gal)
Performance	
Minimum Turning Radius:	
KLX300D	2.4 m (7.9 ft.)
KLX300E	2.3 m (7.5 ft.)
Engine	
Type	4-stroke, DOHC, Single-cylinder
Cooling System	Liquid-cooled
Bore and Stroke	78.0 × 61.2 mm (3.07 × 2.41 in.)
Displacement	292 cm ³ (17.8 cu in.)
Compression Ratio	11.1:1
Maximum Horsepower	(CA, US, CAL) — — —
Maximum Torque	(CA, US, CAL) — — —
Fuel System	FI (Fuel injection), KEIHIN ϕ 34
Fuel Type:	Unleaded gasoline
Minimum Octane Rating:	
Antiknock Index (RON + MON)/2	87
Starting System	Electric starter

1-10 GENERAL INFORMATION

General Specifications

Items	KLX300DM/EM
Ignition System	CDI (Capacitor discharge ignition)
Timing Advance	Electronically advanced (IC igniter in ECU)
Ignition Timing	5° BTDC @1 500 r/min (rpm) ~ 31° BTDC @6 000 r/min (rpm)
Spark Plug	NGK CR8E
Valve Timing:	
Intake:	
Open	20° (BTDC)
Close	64° (ABDC)
Duration	264°
Exhaust:	
Open	63° (BBDC)
Close	21° (ATDC)
Duration	264°
Lubrication System	Forced lubrication (wet sump)
Engine Oil:	
Grade	API SG, SH, SJ, SL or SM with JASO MA, MA1 or MA2
Viscosity	SAE 10W-40
Capacity	1.3 L (1.4 US qt)
Drive Train	
Primary Reduction System:	
Type	Gear
Reduction Ratio	2.800 (84/30)
Clutch Type	Wet multi disc
Transmission:	
Type	6-speed, constant mesh, return shift
Gear Ratios:	
1st	3.000 (30/10)
2nd	2.000 (30/15)
3rd	1.500 (27/18)
4th	1.250 (25/20)
5th	1.050 (21/20)
6th	0.952 (20/21)
Final Drive System:	
Type	Chain drive
Reduction Ratio:	
KLX300D	2.857 (40/14)
KLX300E	2.643 (37/14)
Overall Drive Ratio:	
KLX300D	7.619 @Top gear
KLX300E	7.048 @Top gear
Frame	
Type	Tubular, semi-double cradle

General Specifications

Items	KLX300DM/EM
Caster:	
KLX300D	26.7°
KLX300E	25.0°
Trail:	
KLX300D	106 mm (4.17 in.)
KLX300E	70 mm (2.76 in.)
Front Tire:	
KLX300D:	
Type	D605 FG
Size	3.00-21 51P
Rim Size	21 × 1.60
KLX300E:	
Type	RX-01F
Size	110/70-17 M/C 54S
Rim Size	17M/C × MT3.00
Rear Tire:	
KLX300D:	
Type	D605 G
Size	4.60-18 63P
Rim Size	18 × 2.15
KLX300E:	
Type	RX-01R
Size	130/70-17 M/C 62S
Rim Size	17M/C × MT4.00
Front Suspension:	
Type	Telescopic fork
Wheel Travel:	
KLX300D	255 mm (10.0 in.)
KLX300E	230 mm (9.06 in.)
Rear Suspension:	
Type	Swingarm (Uni-trak)
Wheel Travel:	
KLX300D	230 mm (9.06 in.)
KLX300E	205 mm (8.07 in.)
Brake Type:	
Front	Single disc
Rear	Single disc
Electrical Equipment	
Battery	12 V 6 Ah (10 HR)
Headlight:	
High Beam	12 V 60 W (H4)
Low Beam	12 V 55 W (H4)
Brake/Tail Light	12 V 21/5 W (P21/5W)
Turn Signal Light	12 V 10 W (RY10W)

1-12 GENERAL INFORMATION

General Specifications

Items	KLX300DM/EM
Alternator: Type Maximum Output	Three-phase AC 14.0 A - 18.5 V @5 000 r/min (rpm)

Specifications are subject to change without notice, and may not apply to every country.

Unit Conversion Table

Prefixes for Units:

Prefix	Symbol	Power
mega	M	$\times 1\,000\,000$
kilo	k	$\times 1\,000$
centi	c	$\times 0.01$
milli	m	$\times 0.001$
micro	μ	$\times 0.000001$

Units of Mass:

kg	$\times$	2.205	=	lb
g	$\times$	0.03527	=	oz

Units of Volume:

L	$\times$	0.2642	=	gal (US)
L	$\times$	0.2200	=	gal (IMP)
L	$\times$	1.057	=	qt (US)
L	$\times$	0.8799	=	qt (IMP)
L	$\times$	2.113	=	pint (US)
L	$\times$	1.816	=	pint (IMP)
mL	$\times$	0.03381	=	oz (US)
mL	$\times$	0.02816	=	oz (IMP)
mL	$\times$	0.06102	=	cu in.

Units of Force:

N	$\times$	0.1020	=	kg
N	$\times$	0.2248	=	lb
kg	$\times$	9.807	=	N
kg	$\times$	2.205	=	lb

Units of Length:

km	$\times$	0.6214	=	mile
m	$\times$	3.281	=	ft
mm	$\times$	0.03937	=	in.

Units of Torque:

N·m	$\times$	0.1020	=	kgf·m
N·m	$\times$	0.7376	=	ft·lb
N·m	$\times$	8.851	=	in·lb
kgf·m	$\times$	9.807	=	N·m
kgf·m	$\times$	7.233	=	ft·lb
kgf·m	$\times$	86.80	=	in·lb

Units of Pressure:

kPa	$\times$	0.01020	=	kgf/cm ²
kPa	$\times$	0.1450	=	psi
kPa	$\times$	0.7501	=	cmHg
kgf/cm ²	$\times$	98.07	=	kPa
kgf/cm ²	$\times$	14.22	=	psi
cmHg	$\times$	1.333	=	kPa

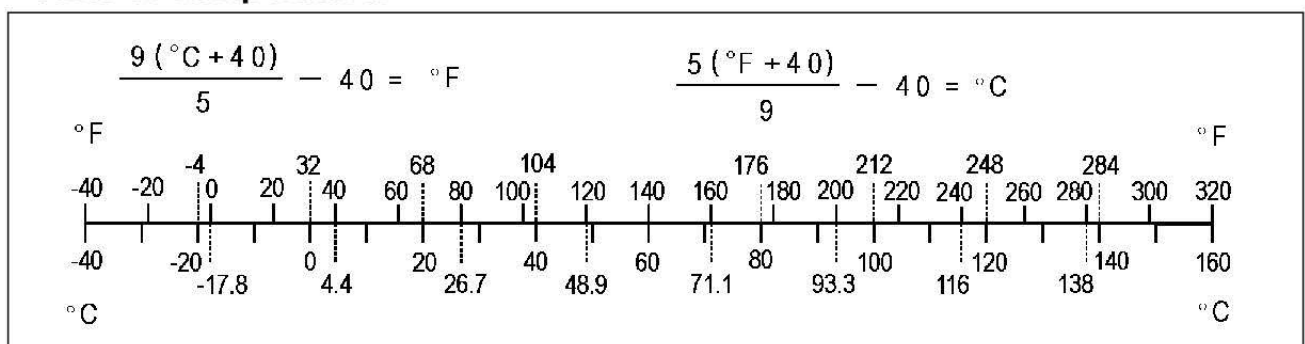
Units of Speed:

km/h	$\times$	0.6214	=	mph
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Units of Power:

kW	$\times$	1.360	=	PS
kW	$\times$	1.341	=	HP
PS	$\times$	0.7355	=	kW
PS	$\times$	0.9863	=	HP

Units of Temperature:



Periodic Maintenance

Table of Contents

Periodic Maintenance Chart	2-3
Daily Checks.....	2-5
Torque and Locking Agent.....	2-6
Specifications	2-12
Special Tools	2-14
Periodic Maintenance Procedures.....	2-15
Fuel System (DFI).....	2-15
Air Cleaner Element Cleaning and Inspection	2-15
Air Cleaner Element Replacement.....	2-17
Idle Speed Inspection	2-17
Idle Speed Adjustment.....	2-17
Throttle Control System Inspection.....	2-18
Fuel System Inspection.....	2-18
Fuel Filter Replacement.....	2-19
Fuel Hose Replacement	2-22
Evaporative Emission Control System Inspection (CAL Model)	2-24
Cooling System.....	2-25
Coolant Level Inspection.....	2-25
Cooling System Inspection	2-25
Coolant Change	2-25
Water Hose and O-ring Replacement.....	2-28
Engine Top End	2-29
Valve Clearance Inspection	2-29
Valve Clearance Adjustment.....	2-29
Air Suction System Damage Inspection.....	2-32
Spark Arrester Cleaning.....	2-32
Clutch.....	2-33
Clutch Operation Inspection	2-33
Engine Lubrication System	2-34
Engine Oil Change.....	2-34
Oil Filter Replacement	2-35
Wheels/Tires	2-35
Air Pressure Inspection.....	2-35
Wheels and Tires Inspection.....	2-36
Wheel Bearing Damage Inspection	2-37
Spoke Tightness and Rim Runout Inspection.....	2-37
Final Drive.....	2-38
Drive Chain Slack Inspection	2-38
Drive Chain Slack Adjustment	2-39
Wheel Alignment Inspection	2-39
Drive Chain Lubrication Condition Inspection	2-40
Drive Chain Wear Inspection	2-40
Chain Guide Wear Inspection	2-41
Brakes.....	2-41
Brake System Inspection	2-41
Brake Operation Inspection	2-42
Brake Fluid Level Inspection.....	2-42
Brake Fluid Change	2-43
Brake Hose Replacement.....	2-44
Master Cylinder Rubber Parts Replacement	2-45

2-2 PERIODIC MAINTENANCE

Caliper Rubber Parts Replacement	2-46
Brake Pad Wear Inspection	2-50
Brake Light Switch Operation Inspection	2-51
Suspension	2-51
Suspension System Inspection	2-51
Rear Suspension Lubrication	2-53
Steering	2-53
Steering Play Inspection	2-53
Steering Play Adjustment.....	2-53
Steering Stem Bearing Lubrication	2-55
Electrical System	2-55
Lights and Switches Operation Inspection	2-55
Headlight Aiming Inspection	2-56
Side Stand Switch Operation Inspection.....	2-57
Engine Stop Switch Operation Inspection.....	2-58
Spark Plug Replacement	2-58
Others	2-59
Chassis Parts Lubrication	2-59
Condition of Bolts, Nuts and Fasteners Tightness Inspection	2-60

Periodic Maintenance Chart

The scheduled maintenance must be done in accordance with this chart to keep the motorcycle in good running condition. **The initial maintenance is vitally important and must not be neglected.**

Periodic Inspection

*A: Service at number of years shown or indicated odometer reading intervals, whichever comes first.

*B: For higher odometer readings, repeat at the frequency interval established here.

*C: Service more frequently when operating in severe conditions: dusty, wet, muddy, high speed, or frequent starting/stopping.

*D: California Model only

○: Emission Related Item

Q: Inspection

↻: Change or Replace

🔧: Lubrication

Items		year (*A)	Odometer Reading (*B) × 1 000 km (× 1 000 mile)					See Page
			1 (0.6)	12 (7.6)	24 (15.2)	36 (22.8)	48 (30.4)	
Fuel System								
○	Air cleaner element (*C)	🔄:2		Q	Q	Q	Q	<u>2-15, 2-17</u>
○	Idle speed		Q	Q	Q	Q	Q	<u>2-17</u>
○	Throttle control system (play, smooth return, no drag)	Q:1	Q	Q	Q	Q	Q	<u>2-18</u>
	Fuel system	Q:1	Q	Q	Q	Q	Q	<u>2-18</u>
	Fuel filter			🔄		🔄		<u>2-19</u>
	Fuel hose	🔄:5						<u>2-22</u>
○	Evaporative emission control system (*D)			Q		Q		<u>2-24</u>
Cooling System								
	Cooling system	Q:1	Q	Q	Q	Q	Q	<u>2-25</u>
	Coolant, water hose and O-ring	🔄:3				🔄		<u>2-25, 2-28</u>
Engine Top End								
○	Valve clearance			Q	Q	Q	Q	<u>2-29</u>
○	Air suction system			Q	Q	Q	Q	<u>2-32</u>
	Spark arrester		Q: every 6 000 km (3 800 mile)					<u>2-32</u>
Clutch								
	Clutch operation (play, engagement, disengagement)	Q:1	Q	Q	Q	Q	Q	<u>2-33</u>
Engine Lubrication System								
	Engine oil (*C) and oil filter	🔄:1	🔄	🔄	🔄	🔄	🔄	<u>2-34, 2-35</u>
Wheels and Tires								
	Wheel bearing damage	Q:1		Q	Q	Q	Q	<u>2-37</u>
	Spoke tightness and rim runout		Q	Q: every 6 000 km (3 800 mile)				<u>2-37</u>

2-4 PERIODIC MAINTENANCE

Periodic Maintenance Chart

Items		year (*A)	Odometer Reading (*B) × 1 000 km (× 1 000 mile)					See Page
			1 (0.6)	12 (7.6)	24 (15.2)	36 (22.8)	48 (30.4)	
Final Drive								
	Drive chain wear (*C)			Q	Q	Q	Q	<u>2-40</u>
	Drive chain guide wear			Q	Q	Q	Q	<u>2-41</u>
Brakes								
	Brake system	Q:1	Q	Q	Q	Q	Q	<u>2-41</u>
	Brake operation (effectiveness, play, no drag)	Q:1	Q	Q	Q	Q	Q	<u>2-42</u>
	Brake fluid (front and rear)	↻:2			↻		↻	<u>2-43</u>
	Brake hose	↻:4						<u>2-44</u>
	Rubber parts of brake master cylinder and caliper	↻:4					↻	<u>2-45,</u> <u>2-46</u>
Suspension								
	Suspension system	Q:1		Q	Q	Q	Q	<u>2-51</u>
	Lubrication of rear suspension				🔧		🔧	<u>2-53</u>
Steering								
	Steering play	Q:1	Q	Q	Q	Q	Q	<u>2-53</u>
	Steering stem bearing	🔧:2			🔧		🔧	<u>2-55</u>
Electrical System								
	Electrical system	Q:1		Q	Q	Q	Q	<u>2-55,</u> <u>2-56,</u> <u>2-57,</u> <u>2-58</u>
○	Spark plug			↻	↻	↻	↻	<u>2-58</u>
Others								
	Chassis parts	🔧:1		🔧	🔧	🔧	🔧	<u>2-59</u>
	Condition of bolts, nuts and fasteners		Q	Q	Q	Q	Q	<u>2-60</u>

Daily Checks

NOTE

○Daily maintenance items should also be checked at every scheduled dealer service.

Daily Maintenance Items		See Page
Fuel	Adequate supply in tank, no leaks	–
Engine oil	Oil level between level lines	–
Tires	Air pressure (when cold), install the air valve cap	2-35
	Tire wear	2-36
Drive chain	Slack: every 1 000 km (600 mile)	2-38
	Lubricate: every 600 km (400 mile)	2-40
Bolts, nuts and fasteners	Check for loose and/or missing bolts, nuts and fasteners	2-60
Steering	Action smooth but not loose from lock to lock	–
	No binding of control cables	–
Brakes	Brake pad wear	2-50
	Brake fluid level	2-42
	No brake fluid leakage	2-41
Throttle	Throttle grip free play	2-18
Clutch	Clutch lever free play	2-33
	Clutch lever operates smoothly	2-33
Coolant	No coolant leakage	2-25
	Coolant level between level lines (when engine is cold)	2-25
Electrical equipment	All lights (head, city, brake/tail, turn signal, license plate, warning/indicator) and horn work	2-55
Engine stop switch	Stops engine	2-58
Side stand	Return to its fully up position by spring tension	–
	Return spring not weak or not damaged	–
Rear view mirrors	Rear view sight	–

2-6 PERIODIC MAINTENANCE

Torque and Locking Agent

The following tables list the tightening torque for the major fasteners requiring use of a non-permanent locking agent or silicone sealant etc. All of the values are for use with dry solvent - cleaned threads unless otherwise indicated.

Letters used in the "Remarks" column mean:

AL: Tighten the two clamp bolts alternately two times to ensure even tightening torque.

G: Apply grease.

L: Apply a non-permanent locking agent.

M: Apply molybdenum disulfide grease.

MO: Apply molybdenum disulfide oil solution.

(mixture of the engine oil and molybdenum disulfide grease in a weight ratio 10:1)

R: Replacement Parts

S: Follow the specified tightening sequence.

Si: Apply silicone grease.

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Fuel System (DFI)				
Switch Housing Screws	3.5	0.36	31 in·lb	
Throttle Pulley Cover Screws	6.9	0.70	61 in·lb	
Delivery Pipe Screw	3.4	0.35	30 in·lb	
Air Cleaner Housing Clamp Screw	2.0	0.20	18 in·lb	
Intake Air Temperature Sensor Screw	1.2	0.12	11 in·lb	
Air Cleaner Housing Mounting Bolt	6.9	0.70	61 in·lb	
ECU Bracket Screws	5.0	0.51	44 in·lb	
Fuel Tank Bracket Bolts	7.0	0.71	62 in·lb	S
Fuel Tank Bolts	7.0	0.71	62 in·lb	S
Ignition Coil Bolts	5.9	0.60	52 in·lb	
Oxygen Sensor	25	2.5	18	
Throttle Body Assy Clamp Screw	2.0	0.20	18 in·lb	
Throttle Body Assy Holder Bolts	12	1.2	106 in·lb	
Water Temperature Sensor	12	1.2	106 in·lb	
Fuel Pump Assembly Screws	2.06	0.210	18.2 in·lb	R
Lead Terminal Screw	1.18	0.120	10 in·lb	R
Fuel Pump Bolts	9.8	1.0	87 in·lb	L, S
Crankshaft Sensor Screws	2.5	0.25	22 in·lb	
Vehicle-down Sensor Bracket Bolts	9.8	1.0	87 in·lb	
Separator Bracket Bolts	9.8	1.0	87 in·lb	
Cooling System				
Radiator Bolts	6.9	0.70	61 in·lb	
Radiator Bracket Bolts	9.8	1.0	87 in·lb	
Radiator Screen Bolts	6.9	0.70	61 in·lb	
Radiator Fan Bolts	8.4	0.86	74 in·lb	
Thermostat Housing Bolts	12	1.2	106 in·lb	L
Water Temperature Sensor	12	1.2	106 in·lb	
Water Hose Bracket Bolt	9.8	1.0	87 in·lb	
Water Hose Fitting Bolts	9.8	1.0	87 in·lb	
Coolant Reserve Tank Bolts	6.9	0.70	61 in·lb	

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Coolant Drain Bolt	25	2.5	18	
Water Pump Impeller Nut	7.8	0.80	69 in·lb	
Water Pump Cover Bolts	9.8	1.0	87 in·lb	
Engine Top End				
Spark Plug	13	1.3	115 in·lb	
Cylinder Head Cover Bolts	7.8	0.80	69 in·lb	
Camshaft Cap Bolts (L = 38 mm)	12	1.2	106 in·lb	S
Camshaft Cap Bolts (L = 46 mm)	12	1.2	106 in·lb	S
Cylinder Head Bolts (M10, First)	15	1.5	11	M, S
Cylinder Head Bolts (M10, Final)	46	4.7	34	M, S
Cylinder Head Bolts (M6)	12	1.2	106 in·lb	S
Cylinder Head Jacket Plug	20	2.0	15	L
Cylinder Head Damper Bolt	7.8	0.80	69 in·lb	
Throttle Body Assy Holder Bolts	12	1.2	106 in·lb	
Air Suction Valve Cover Bolts	9.8	1.0	87 in·lb	L
Camshaft Sprocket Bolts	9.8	1.0	87 in·lb	L
Camshaft Chain Guide Retaining Plate Bolt	9.8	1.0	87 in·lb	
Camshaft Chain Tensioner Cap Bolt	20	2.0	15	
Camshaft Chain Tensioner Bolts	9.8	1.0	87 in·lb	
Camshaft Chain Sub-tensioner Bolt	15	1.5	11	
Camshaft Chain Guide Bolt	25	2.5	18	
Exhaust Pipe Cover Bolts	9.8	1.0	87 in·lb	
Exhaust Pipe Holder Nuts	21	2.1	15	S
Muffler Body Clamp Bolt	10	1.0	89 in·lb	S
Muffler Cover Bolts	6.9	0.70	61 in·lb	S
Oxygen Sensor	25	2.5	18	
Muffler Body Bolts (Front/Center)	30	3.1	22	S
Muffler Body Nut	40	4.1	30	S
Muffler Body Bolt (Rear)	9.8	1.0	87 in·lb	S
Clutch				
Clutch Cable Holder Bolts	9.8	1.0	87 in·lb	S
Right Engine Cover Bolts (L = 70 mm)	9.8	1.0	87 in·lb	S
Clutch Cover Bolts	9.8	1.0	87 in·lb	S
Oil Seal Retaining Plate Bolt	12	1.2	106 in·lb	L
Clutch Cover Damper Plate Bolts	7.0	0.71	62 in·lb	L
Clutch Spring Bolts	5.0	0.51	44 in·lb	
Clutch Hub Nut	155	15.8	114	
Right Engine Cover Bolts (L = 25 mm)	9.8	1.0	87 in·lb	L (1), S
Right Engine Cover Bolt (L = 30 mm)	9.8	1.0	87 in·lb	S
Engine Lubrication System				
Oil Pipe Banjo Bolt (M10)	20	2.0	15	
Oil Pipe Banjo Bolts (M8)	9.8	1.0	87 in·lb	
Engine Oil Drain Bolt	15	1.5	11	

2-8 PERIODIC MAINTENANCE

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Oil Filter Cap Bolts	9.8	1.0	87 in·lb	
Oil Pressure Relief Valve	15	1.5	11	L
Oil Seal Retaining Plate Bolt	12	1.2	106 in·lb	L
Oil Pump Mounting Screws (L = 30 mm)	5.2	0.53	46 in·lb	
Oil Pump Mounting Screw (L = 25 mm)	5.2	0.53	46 in·lb	
Oil Pump Cover Screws	10	1.0	89 in·lb	
Engine Removal/Installation				
Upper Engine Bracket Bolts	23	2.3	17	S
Upper Engine Mounting Bolt	50	5.1	37	S
Middle Engine Bracket Nuts	50	5.1	37	R, S
Middle Engine Mounting Nut	50	5.1	37	R, S
Lower Engine Mounting Nut	50	5.1	37	R, S
Swingarm Pivot Shaft Nut	88	9.0	65	S
Crankshaft/Transmission				
Torque Limiter Cover Bolts	9.8	1.0	87 in·lb	
Primary Gear Nut	98	10	72	
Starter Motor Clutch Bolts	12	1.2	106 in·lb	L
Shift Drum Bearing Retaining Bolts	9.8	1.0	87 in·lb	
Shift Shaft Return Spring Pin	37	3.8	27	L
Crankcase Allen Bolt (L = 35 mm)	15	1.5	11	S
Crankcase Bolts (L = 70 mm)	9.8	1.0	87 in·lb	S
Crankcase Bolts (L = 50 mm)	9.8	1.0	87 in·lb	S
Crankcase Allen Bolt (L = 50 mm)	15	1.5	11	S
Shift Drum Cam Holder Bolt	12	1.2	106 in·lb	L
Gear Positioning Lever Nut	9.8	1.0	87 in·lb	
Neutral Switch	15	1.5	11	G
Cover/Guard Plate Bolt	9.8	1.0	87 in·lb	L
Drive Chain Guard Plate Bolts	9.8	1.0	87 in·lb	
Shift Pedal Bolt	12	1.2	106 in·lb	
External Shift Mechanism Cover Bolt (L = 30 mm)	9.8	1.0	87 in·lb	
External Shift Mechanism Cover Screw	5.2	0.53	46 in·lb	
External Shift Mechanism Cover Nut	9.8	1.0	87 in·lb	
External Shift Mechanism Cover Bolts (L = 20 mm)	9.8	1.0	87 in·lb	
Wheels/Tires				
Spoke Nipples	4.0	0.41	35 in·lb	
Front Axle Nut	88	9.0	65	
Front Axle Clamp Bolts	20	2.0	15	AL
Rear Axle Nut	110	11.2	81.1	R
Final Drive				
Engine Sprocket Cover Bolts	9.8	1.0	87 in·lb	L (1)
Engine Sprocket Nut	129	13.2	95.2	MO

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Rear Sprocket Nuts	34	3.5	25	R, S
Brakes				
Brake Hose Banjo Bolts	25	2.5	18	
Brake Reservoir Cap Screws	1.5	0.15	13 in·lb	
Brake Lever Pivot Bolt	5.9	0.60	52 in·lb	Si
Brake Lever Pivot Locknut	5.9	0.60	52 in·lb	
Front Brake Light Switch Screw	1.2	0.12	11 in·lb	
Front Master Cylinder Clamp Bolts	8.8	0.90	78 in·lb	S
Front Caliper Holder Pin Nut	22	2.2	16	L
Front Caliper Holder Pin	17	1.7	13	Si
Front Caliper Mounting Bolts	25	2.5	18	
Caliper Bleed Valve	7.8	0.80	69 in·lb	
Front Brake Pad Pins	17	1.7	13	
Brake Disc Bolts	23	2.3	17	L, S
Rear Master Cylinder Mounting Bolts	7.8	0.80	69 in·lb	
Rear Master Cylinder Push Rod Locknut	17	1.7	13	
Rear Caliper Mounting Bolt	27	2.8	20	Si
Rear Brake Pad Pin	17	1.7	13	
Rear Brake Pad Pin Plug	2.5	0.25	22 in·lb	
Suspension				
Upper Front Fork Clamp Bolts	20	2.0	15	AL
Lower Front Fork Clamp Bolts	25	2.5	18	
Front Fork Top Plugs	30	3.1	22	
Piston Rod Nuts	15	1.5	11	
Front Fork Cylinder Valve Assy	55	5.6	41	L
Swingarm Pivot Shaft Nut	88	9.0	65	
Rocker Arm Nut	98	10	72	
Rear Shock Absorber Bolts	39	4.0	29	
Tie-Rod Nuts	83	8.5	61	R
Steering				
Handlebar Clamp Bolts	25	2.5	18	S
Switch Housing Screws	3.5	0.36	31 in·lb	
Steering Stem Head Nut	44	4.5	32	
Steering Stem Nut	4.9	0.50	43 in·lb	
Frame				
Side Stand Bolt	30	3.1	22	
Side Stand Nut	44	4.5	32	R
Rear Footpeg Pivot Bolts	25	2.5	18	
Front Footpeg Bracket Bolt	39	4.0	29	
Front Footpeg Bracket Nut	39	4.0	29	R
Shroud Bolts	6.9	0.70	61 in·lb	
Rear Fender Bolts	6.9	0.70	61 in·lb	

2-10 PERIODIC MAINTENANCE

Torque and Locking Agent

Fastener	Torque			Remarks
	N·m	kgf·m	ft·lb	
Electrical System				
Regulator/Rectifier Bolts	9.8	1.0	87 in·lb	L
Ignition Coil Bolts	5.9	0.60	52 in·lb	
Starter Motor Clutch Bolts	12	1.2	106 in·lb	
Spark Plug	13	1.3	115 in·lb	
Crankshaft Sensor Screws	2.5	0.25	22 in·lb	
Alternator Rotor Bolt	135	13.8	100	
Torque Limiter Cover Bolts	9.8	1.0	87 in·lb	
Stator Coil Bolts	5.9	0.60	52 in·lb	
Starter Motor Mounting Bolts	9.8	1.0	87 in·lb	
Starter Motor Cable Nut	9.8	1.0	87 in·lb	
Starter Relay Terminal Screws	5.0	0.51	44 in·lb	
Starter Motor Terminal Locknut	11	1.1	97 in·lb	
Brush Holder Screw	3.8	0.39	34 in·lb	
Starter Motor Through Bolts	5.0	0.51	44 in·lb	
Alternator Cover Bolts (L = 30 mm)	9.8	1.0	87 in·lb	
Alternator Cover Bolts (L = 40 mm)	9.8	1.0	87 in·lb	
Oxygen Sensor	25	2.5	18	
Brake/Tail Light Mounting Nuts	5.9	0.60	52 in·lb	
Brake/Tail Light Lens Screws	1.0	0.10	8.9 in·lb	
Switch Housing Screws	3.5	0.36	31 in·lb	
Front Brake Light Switch Screw	1.2	0.12	11 in·lb	
Neutral Switch	15	1.5	11 in·lb	G
Engine Ground Terminal Bolt	9.8	1.0	87 in·lb	S
Side Stand Switch Bolt	8.8	0.90	78 in·lb	L

Torque and Locking Agent

The table below, relating tightening torque to thread diameter, lists the basic torque for the bolts and nuts. Use this table for only the bolts and nuts which do not require a specific torque value. All of the values are for use with dry solvent-cleaned threads.

Basic Torque for General Fasteners

Threads Diameter (mm)	Torque		
	N·m	kgf·m	ft·lb
5	3.4 ~ 4.9	0.35 ~ 0.50	30 ~ 43 in·lb
6	5.9 ~ 7.8	0.60 ~ 0.80	52 ~ 69 in·lb
8	14 ~ 19	1.4 ~ 1.9	10 ~ 13.5
10	25 ~ 34	2.6 ~ 3.5	19 ~ 25
12	44 ~ 61	4.5 ~ 6.2	33 ~ 45
14	73 ~ 98	7.4 ~ 10.0	54 ~ 72
16	115 ~ 155	11.5 ~ 16.0	83 ~ 115
18	165 ~ 225	17.0 ~ 23.0	125 ~ 165
20	225 ~ 325	23.0 ~ 33.0	165 ~ 240

2-12 PERIODIC MAINTENANCE

Specifications

Item	Standard
Fuel System (DFI)	
Throttle Grip Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)
Idle Speed	1 500 ±50 r/min (rpm)
Air Cleaner Element	Polyurethane foam
Air Cleaner Element Oil	High-quality foam air filter oil
Cooling System	
Coolant:	
Type (Recommended)	Permanent type of antifreeze
Color	Green
Mixed Ratio	Soft water 50%, coolant 50%
Freezing Point	−35°C (−31°F)
Total Amount	1.2 L (1.3 US qt)
Engine Top End	
Valve Clearance:	
Exhaust	0.15 ~ 0.24 mm (0.0059 ~ 0.0094 in.)
Intake	0.10 ~ 0.19 mm (0.0039 ~ 0.0075 in.)
Clutch	
Clutch Lever Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)
Engine Lubrication System	
Engine Oil:	
Type	API SG, SH, SJ, SL or SM with JASO MA, MA1 or MA2
Viscosity	SAE 10W-40
Capacity	1.0 L (1.1 US qt) (When filter is not removed.) 1.1 L (1.2 US qt) (When filter is removed.) 1.3 L (1.4 US qt) (When engine is completely dry.)
Oil Level	Between upper and lower level lines (Wait several minutes after idling or running)
Wheels/Tires	
Rim Runout:	
Axial	TIR 1.0 mm (0.04 in.) or less [Service Limit: TIR 2.0 mm (0.08 in.)]
Radial	TIR 1.0 mm (0.04 in.) or less [Service Limit: TIR 2.0 mm (0.08 in.)]
KLX300D:	
Air Pressure (when cold):	
Front	150 kPa (1.50 kgf/cm ² , 22 psi)
Rear	Up to 97.5 kg (215 lb) load: 150 kPa (1.50 kgf/cm ² , 22 psi) 97.5 ~ 184 kg (215 ~ 406 lb) load: 175 kPa (1.75 kgf/cm ² , 25 psi)
Tread Depth:	
Front	7.8 mm (0.31 in.) [Service Limit: 2 mm (0.08 in.)]
Rear	11.8 mm (0.46 in.) [Service Limit: 2 mm (0.08 in.)]

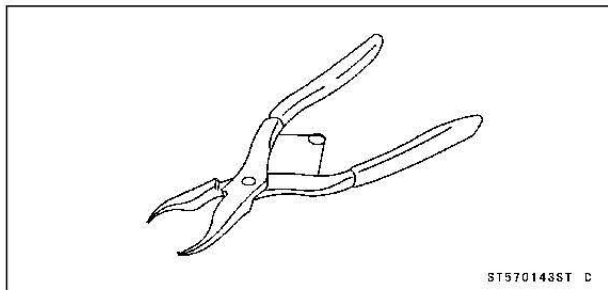
Specifications

Item	Standard
KLX300E: Air Pressure (when cold): Front Rear Tread Depth: Front Rear	200 kPa (2.0 kgf/cm ² , 29 psi) 225 kPa (2.25 kgf/cm ² , 33 psi) 4.4 mm (0.17 in.) [Service Limit: 1 mm (0.04 in.)] 6.5 mm (0.26 in.) [Service Limit: Up to 130 km/h (80 mph), 2 mm (0.08 in.) Over 130 km/h (80 mph) 3 mm (0.12 in.)]
Final Drive Drive Chain Slack Drive Chain Wear (20-link Length) Standard Chain: Make Type Link (KLX300D) Link (KLX300E)	30 ~ 40 mm (1.2 ~ 1.6 in.) 317.5 ~ 318.2 mm (12.50 ~ 12.53 in.) [Service Limit: 319 mm (12.6 in.)] ENUMA EK520LVO3 (when shipping) EK520SRO2 106 links 104 links
Brakes Brake Fluid: Grade Brake Pad: Lining Thickness: Front Rear Brake Light Timing: Front Rear	DOT3 or DOT4 4.5 mm (0.18 in.) [Service Limit: 1 mm (0.04 in.)] 6.4 mm (0.25 in.) [Service Limit: 1 mm (0.04 in.)] Pulled ON ON after about 10 mm (0.39 in.) of pedal travel
Electrical System Spark Plug: Type Gap	NGK CR8E 0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)

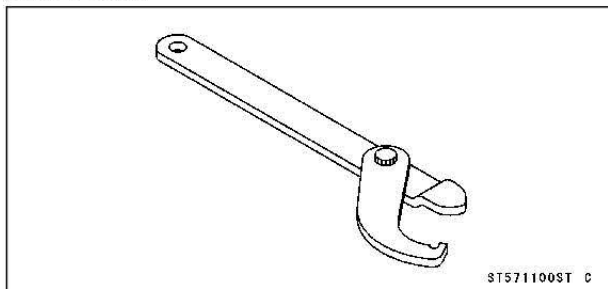
2-14 PERIODIC MAINTENANCE

Special Tools

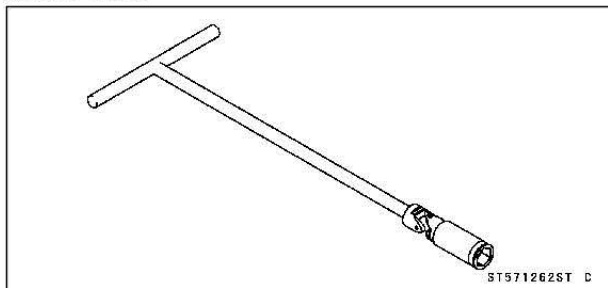
Inside Circlip Pliers:
57001-143



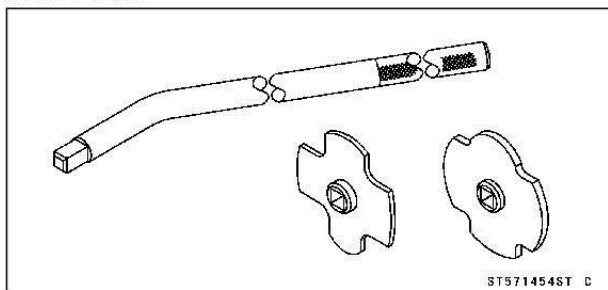
Steering Stem Nut Wrench:
57001-1100



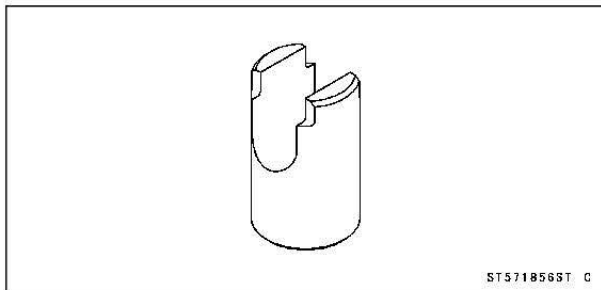
Spark Plug Wrench, Hex 16:
57001-1262



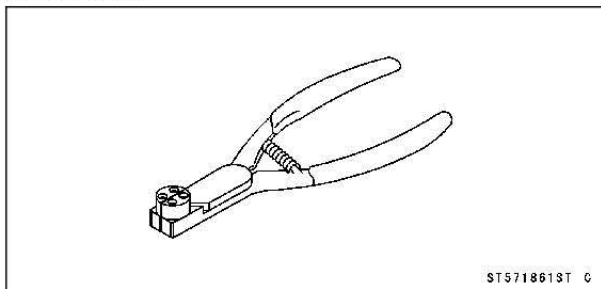
Filler Cap Driver:
57001-1454



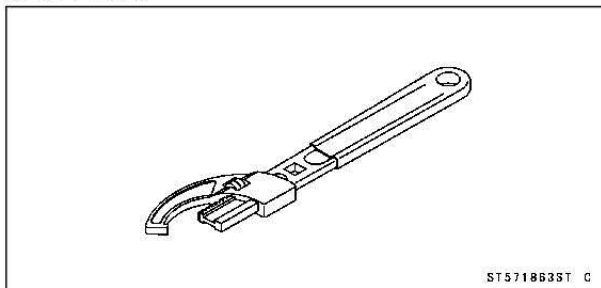
Fuel Filter Compressor:
57001-1856



Brake Caliper Piston Pliers ($\phi 16 \sim \phi 26$):
57001-1861



Adjustable Hook Wrench:
57001-1863



Periodic Maintenance Procedures

Fuel System (DFI)

Air Cleaner Element Cleaning and Inspection

NOTE

- In dusty areas, the element should be replaced more frequently than the recommended interval.
- After riding through rain or on muddy roads, the element should be replaced immediately.

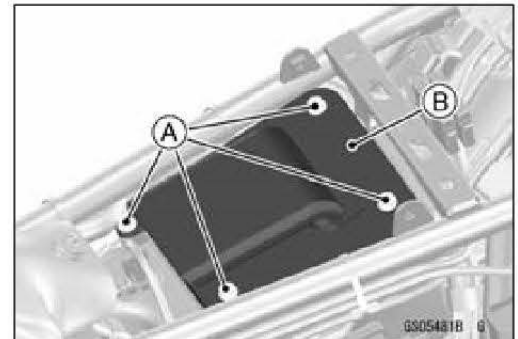
WARNING

If dirt or dust is allowed to pass through into the throttle body assy, the throttle may become stuck, possibly causing accident. Replace the air cleaner element according to the maintenance chart.

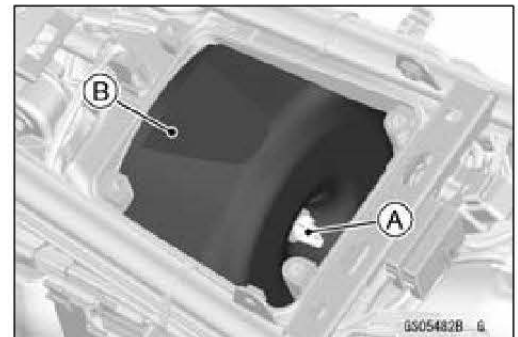
NOTICE

If dirt gets through into the engine, excessive engine wear and possibly engine damage will occur.

- Remove:
 - Seat (see Seat Removal (15-7))
 - Bolts [A]
 - Air Cleaner Cap [B]



- Remove:
 - Wing Bolt [A] and Washer
 - Air Cleaner Element [B]
- Stuff pieces of lint-free, clean cloth into the air cleaner housing to keep dirt out of the throttle body assy and engine.
- Wipe out the inside of the air cleaner housing with a clean damp towel.



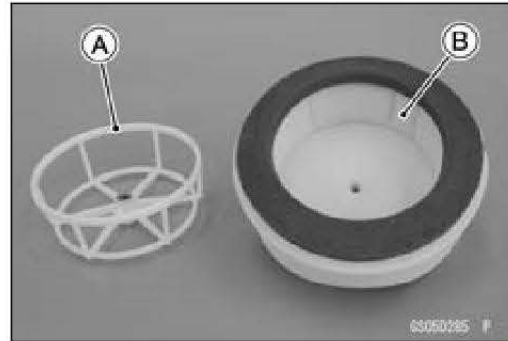
NOTICE

Check inside of the inlet tract and throttle body assy for dirt. If dirt is present, clean the intake tract and throttle body assy thoroughly. You may also need to replace the element and seal the housing and intake tract.

2-16 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

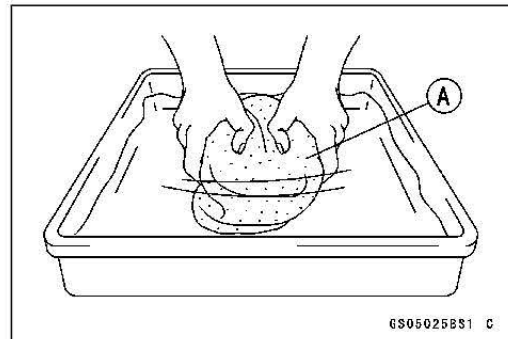
- Separate the frame [A] from the element [B].
- Check the air cleaner element for condition. If there is any damage, tears or deteriorations, the element must be replaced.



WARNING

Gasoline and low flash-point solvents can be flammable and/or explosive and cause severe burns. Clean the element in a well-ventilated area, and take care that there is no spark or flame anywhere near the working areas. Do not use gasoline or low flash-point solvents to clean the element.

- Clean the element [A] in a bath of a high flash-point solvent using a soft bristle brush.
- Rinse the element with clean water to remove all traces of cleaning solution.

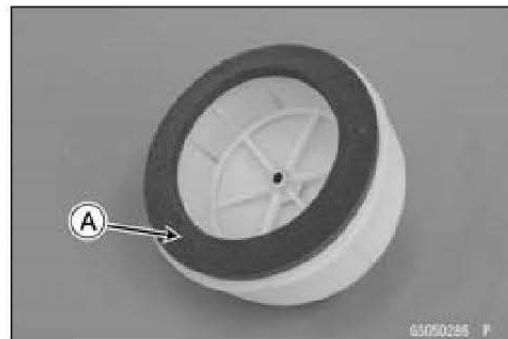
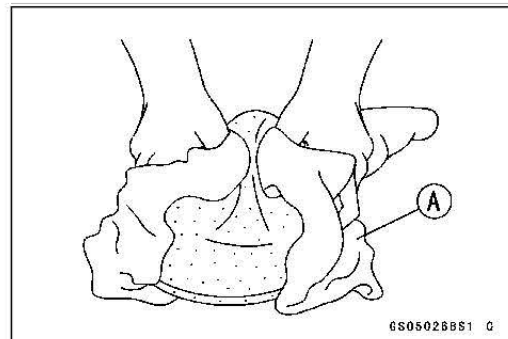


- Squeeze it dry in a clean towel [A]. Do not wring the element or blow it dry; the element can be damaged.
- Check all parts of the element for visible damage.
- ★ If any parts of the element are damaged, replace them.

NOTE

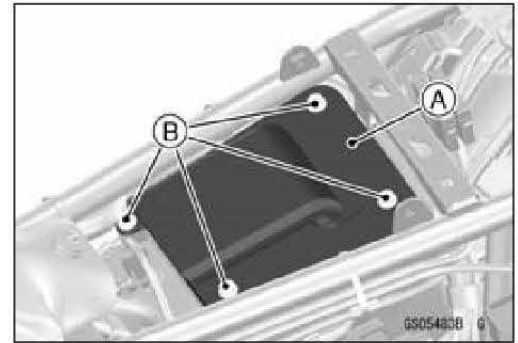
○ Do not twist, wring or blow the element to avoid damaging it.

- After cleaning, saturate the element with a high-quality foam-air-filter oil, squeeze out the excess oil, then wrap it in a clean towel and squeeze it as dry as possible.
- Install the frame into the element.
- Coat the lip of the element with a thick layer of all purpose grease [A] to assure a complete seal against the air cleaner element base. Also, coat the base where the lip of the element fits.



Periodic Maintenance Procedures

- Remove the towel from the air cleaner duct.
- Install:
 - Element
 - Washer
- Tighten:
 - Wing Bolt
- Install:
 - Air Cleaner Cap [A]
- Tighten:
 - Bolts [B]



Air Cleaner Element Replacement

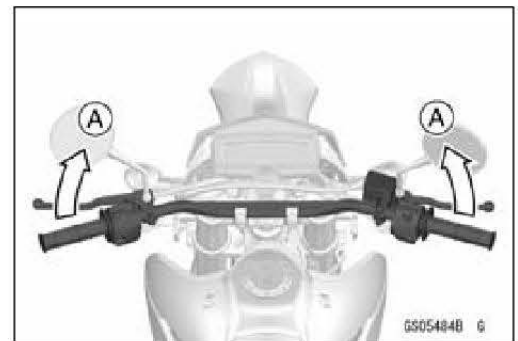
NOTE

○ In dusty areas, the element should be replaced more frequently than the recommended interval.

- Refer to the Air Cleaner Element Cleaning and Inspection (see Air Cleaner Element Cleaning and Inspection(2-15))

Idle Speed Inspection

- Start the engine and warm it up thoroughly.
- At first the engine will run fast to decrease warm up time (fast idle).
- Gradually the fast idle will lower to a certain RPM automatically. This is the idle speed.
- With the engine idling, turn the handlebars to both sides [A].
- ★ If handlebars movement changes the idle speed, the throttle cables may be improperly adjusted or incorrectly routed or damaged. Be sure to correct any of these conditions before riding (see Throttle Control System Inspection(2-18)) (see Cable, Wire, and Hose Routing section (17-2)).



⚠ WARNING

Operation with improperly adjusted, incorrectly routed or damaged cables could result in an unsafe riding condition. Follow the service manual to be make sure to correct any of these conditions.

- Check the idle speed.
- ★ If the idle speed is out of specified range, adjust it.

Idle Speed

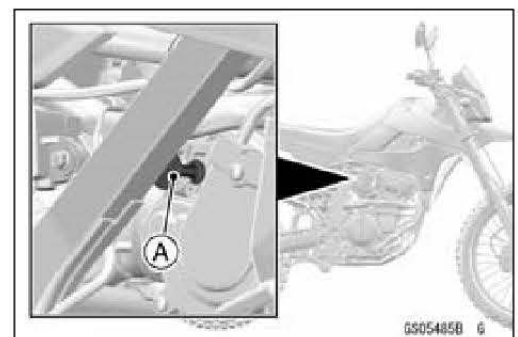
Standard: 1 500 ±50 r/min (rpm)

Idle Speed Adjustment

- Start the engine and warm it up thoroughly.
- Turn the adjusting screw [A] until the idle speed is correct.
- Open and close the throttle a few times to make sure that the idle speed is within the specified range. Readjust if necessary.

⚠ WARNING

The engine gets extremely hot during normal operation and can cause serious burns. Never touch a hot engine.



2-18 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

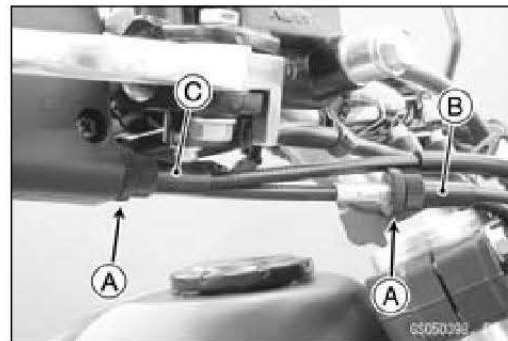
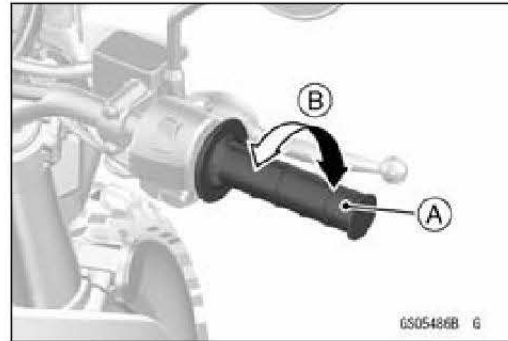
Throttle Control System Inspection

- Keep the handlebars straight ahead.
- Check that the throttle grip [A] moves smoothly from full open to close, and the throttle closes quickly and completely by the return spring in all steering positions.
- ★ If the throttle grip does not return properly, check the throttle cable routing, grip free play, and cable damage. Then lubricate the throttle cables.
- Check the throttle grip free play [B].

Throttle Grip Free Play

Standard: 2 ~ 3 mm (0.08 ~ 0.12 in.)

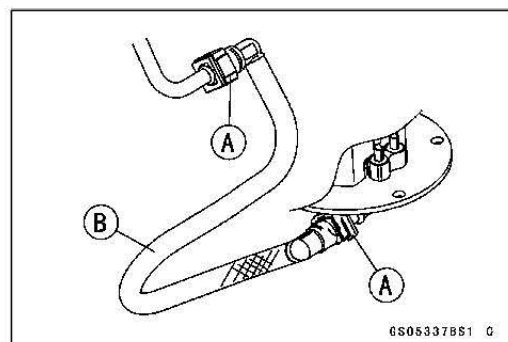
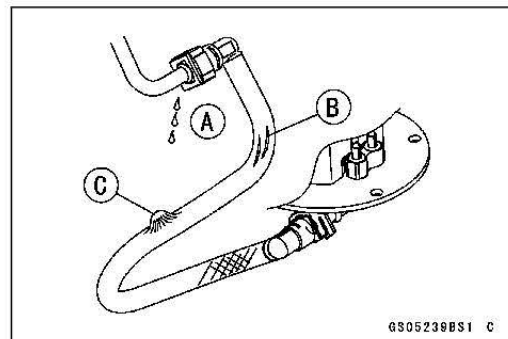
- ★ If the free play is incorrect, adjust the throttle cables as follows.
- Loosen the locknuts [A].
- Screw both throttle cable adjusters [B] [C] to give the throttle grip plenty of play.
- Turn the decelerator cable adjuster [B] until there is no play when the throttle grip play completely closed.
- Tighten the decelerator side locknut.
- Turn the accelerator cable adjuster [C] until 2 ~ 3 mm (0.08 ~ 0.12 in.) of throttle grip play is obtained.
- Tighten the accelerator side locknut.
- ★ If the free play can not be adjusted with the adjusters, replace the cables.



Fuel System Inspection

Fuel Hose Inspection (fuel leak, damage, installation condition)

- If the motorcycle is not properly handled, the high pressure inside the fuel line can cause fuel to leak [A] or the hose to burst. Remove the fuel tank (see [Fuel Tank Removal\(3-113\)](#)) and check the fuel hose.
 - ★ Replace the fuel hose if any fraying, cracks [B] or bulges [C] are noticed.
 - Check that the fuel hose is routed correctly (see [Cable, Wire, and Hose Routing section \(17-2\)](#)).
 - ★ Replace the hose if it has been sharply bent or kinked.
- Hose Joints [A]
Fuel Hose [B]



Periodic Maintenance Procedures

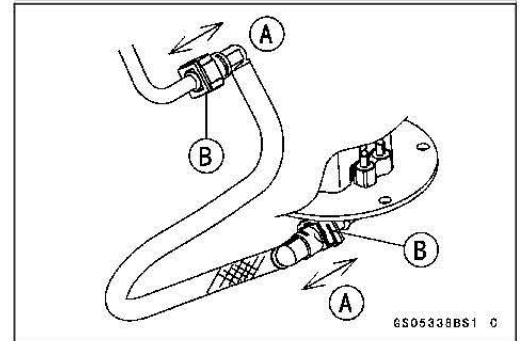
- Check that the fuel hose joints are securely connected.
- Push and pull [A] the fuel hose joint [B] back and forth more than two times, and make sure it is locked.



WARNING

Leaking fuel can cause a fire or explosion resulting in serious burns. Make sure the hose joint is installed correctly on the delivery pipe by sliding the joint.

★ If it does not lock, reinstall the hose joint.



Fuel Filter Replacement



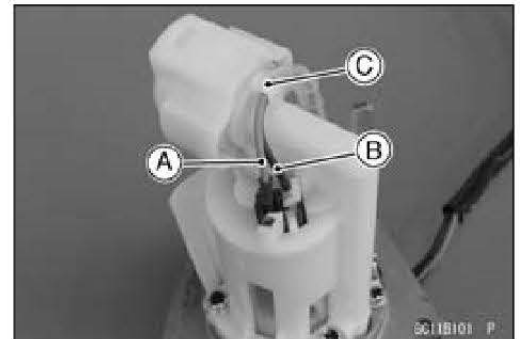
WARNING

Gasoline is extremely flammable and can be explosive under certain conditions, creating the potential for serious burns. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light. Do not smoke. Turn the ignition switch off. Disconnect the battery (–) terminal. To avoid fuel spills, draw it from the tank when the engine is cold. Be prepared for fuel spillage; any spilled fuel must be completely wiped up immediately.

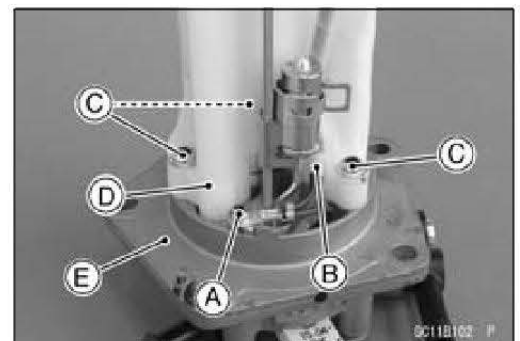
NOTICE

Never drop the fuel pump especially on a hard surface. Such a shock to the pump can damage it.

- Remove:
 - Fuel Pump (see Fuel Pump Removal(3-101))
- Disconnect:
 - Lead Terminal (Red) [A]
 - Lead Terminal (Black) [B]
- Remove the leads from the guide [C].



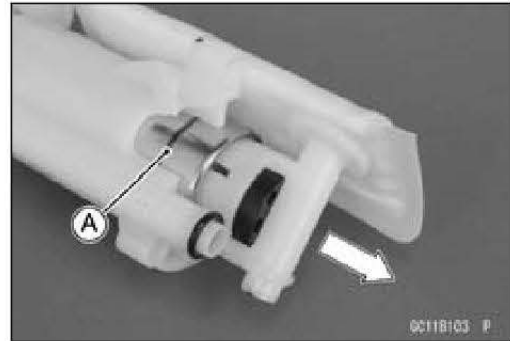
- Remove the lead terminal screw [A].
- Remove the leads from the guide [B].
- Remove the fuel pump assembly screws [C].
- Remove the fuel pump case [D] from the fuel pump holder [E].



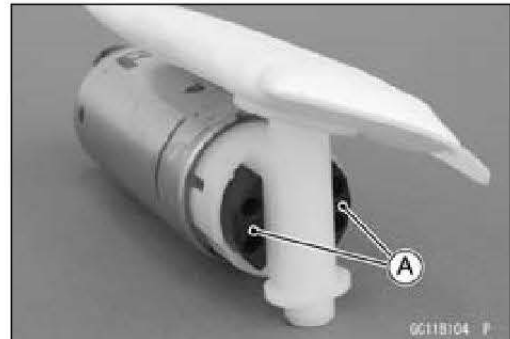
2-20 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

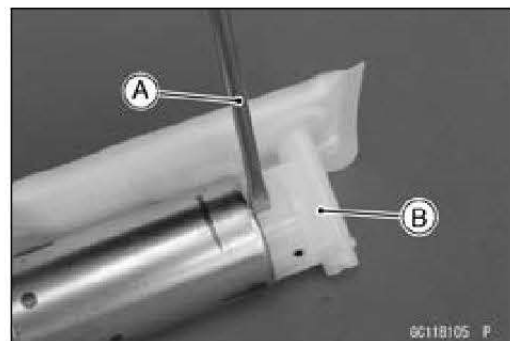
- Remove the fuel pump body [A] from the fuel pump case.



- Remove the insulators [A].

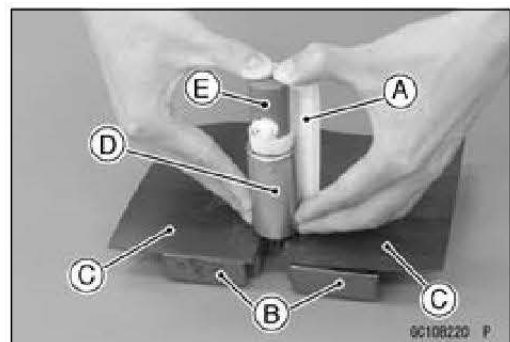


- Using the flat tip screwdriver [A], remove the fuel filter [B].



- Replace the fuel filter [A] with a new one.
- Prepare the following suitable tools on the flat surface as shown.
 - Blocks [B]
 - Rubber Sheets ($t = 2 \text{ mm}$) [C]
- Set the fuel pump [D] and fuel filter on the rubber sheets.
- Press down the fuel filter compressor [E] by fingers until the fuel filter is bottomed.

Special Tool - Fuel Filter Compressor: 57001-1856

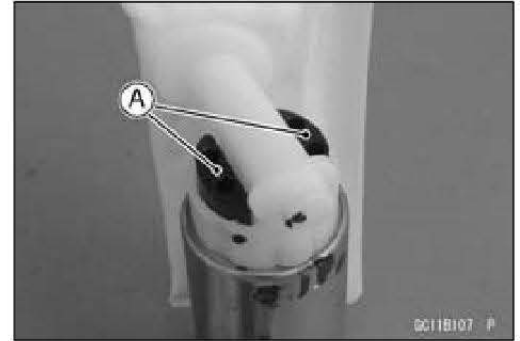


NOTE

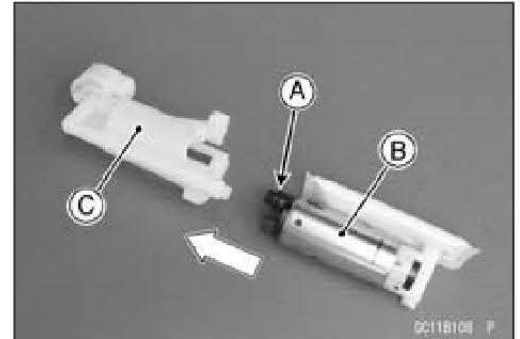
○Do not tap the fuel filter compressor with a hammer because the pump may be damaged.

Periodic Maintenance Procedures

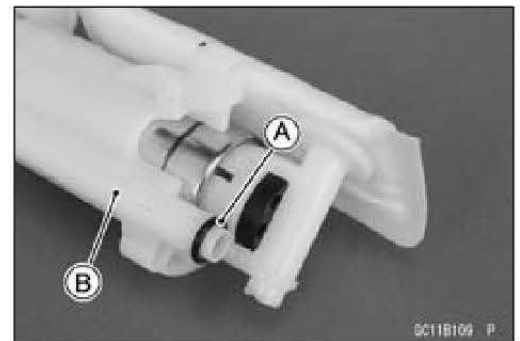
- Replace the insulators [A] with new ones.
- Install the insulators so that its hole side faces the lower of the fuel pump as shown.



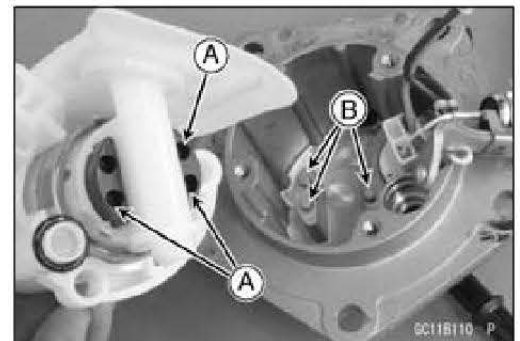
- Replace the O-ring [A] with a new one.
- Apply engine oil to the O-ring, and install it to the fuel pump body [B].
- Insert the fuel pump body into the fuel pump case [C] to the bottom.



- Replace the O-ring [A] with a new one.
- Apply engine oil to the O-ring, and install it to the fuel pump case [B].



- Fit the holes [A] on insulator to the projections [B], and install the fuel pump case to the fuel pump holder firmly.
- Be sure not to come off the installed insulator.

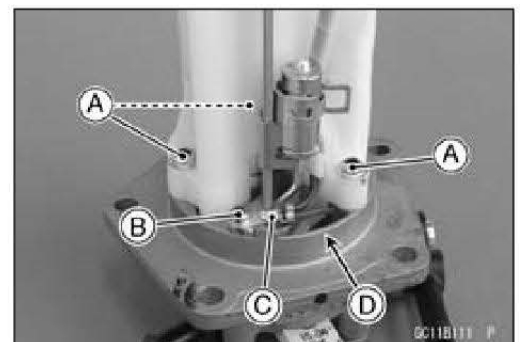


- Replace the fuel pump assembly screws [A] and lead terminal screw [B] with new ones.
- Tighten:

Torque - Fuel Pump Assembly Screws: 2.06 N·m (0.210 kgf·m, 18 in·lb)

Lead Terminal Screw: 1.18 N·m (0.120 kgf·m, 10 in·lb)

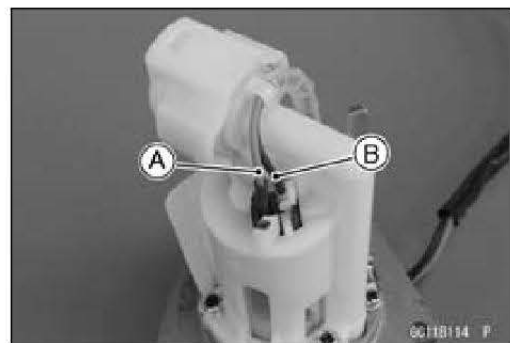
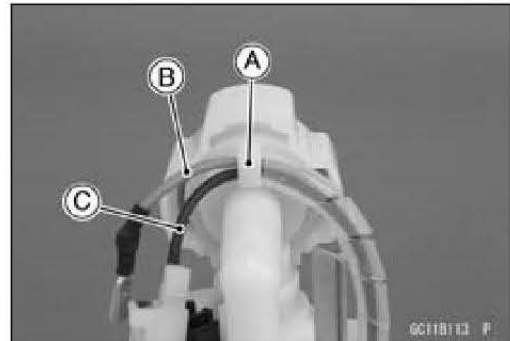
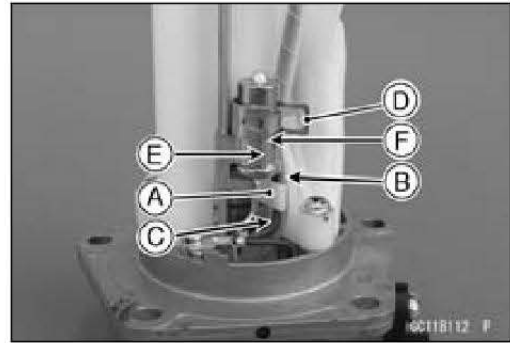
- Install the lead [C] to be inside of the outer diameter of the fuel pump holder [D].



2-22 PERIODIC MAINTENANCE

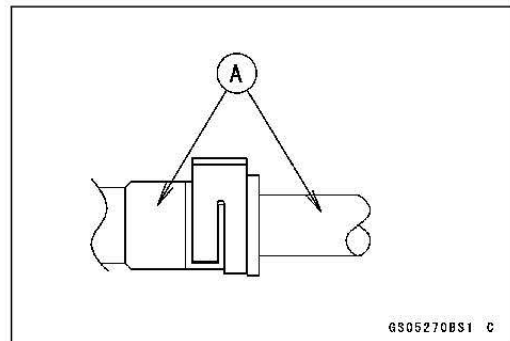
Periodic Maintenance Procedures

- Run the leads in the guide [A] as shown.
Red Lead [B]
Black Lead [C]
 - Run the leads in the back of clamp tab [D].
 - Align the thermistor bracket edge [E] and the clamp notch [F], and install the clamp tab to be inside of the outer diameter of the fuel pump holder.
-
- Run the leads in the guide [A] as shown.
Red Lead [B]
Black Lead [C]
-
- Connect the lead terminals to the fuel pump body as shown.
Lead Terminal (Red) [A]
Lead Terminal (Black) [B]



Fuel Hose Replacement

- Remove:
Fuel Tank (see Fuel Tank Removal(3-113))
- Be sure to place a piece of cloth around the fuel hose joint.
- Wipe off the dirt of the surface [A] around the connection using a cloth or a soft brush.



Periodic Maintenance Procedures

When removing with flat tip screwdriver

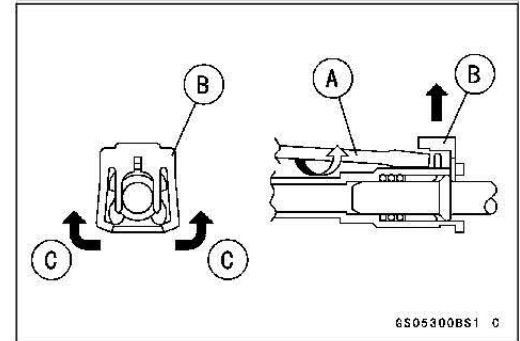
- Insert the flat tip screwdriver [A] into slit on the joint lock [B].
- Turn the driver to disconnect the joint lock.

When removing with fingers

- Open and push up [C] the joint lock with your fingers.

NOTICE

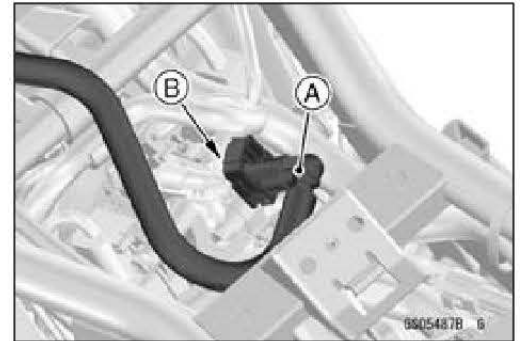
Prying or excessively widening the joint lock ends for fuel hose removal will permanently deform the joint lock, resulting in a loose or incomplete lock that may allow fuel to leak and create the potential for a fire explosion. To prevent fire or explosion from a damaged joint lock, do not pry or excessively widen the joint lock ends when removing the fuel hose. The joint lock has a retaining edge that locks around the housing.



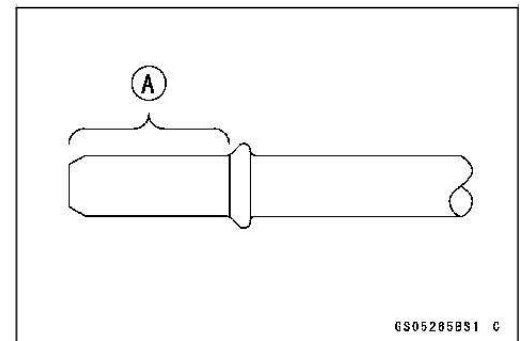
- Pull the fuel hose joint [A] out of the delivery pipe [B].

⚠ WARNING

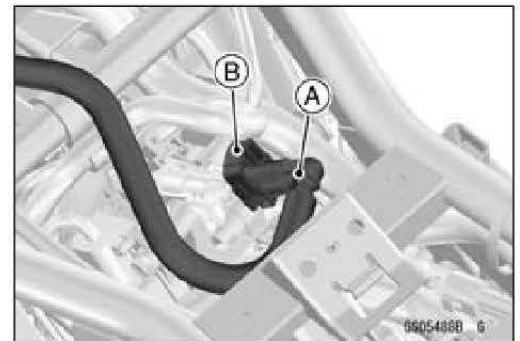
Fuel is flammable and explosive under certain conditions and can cause severe burns. Be prepared for fuel spillage; any spilled fuel must be completely wiped up immediately. When the fuel hose is disconnected, fuel spills out from the hose and the pipe. Cover the hose connection with a clean shop towel to prevent fuel spillage.



- Clean the delivery pipe.
- Cover the delivery pipe with the vinyl bag to keep it clean.
- Remove the vinyl bag on the pipe.
- Check that there are no flaws, burrs, and adhesion of foreign materials on the delivery pipe [A].



- Replace the fuel hose with a new one.
- Run the fuel hose correctly (see Cable, Wire, and Hose Routing section (17-2)).
- Insert the fuel hose joint [A] straight onto the delivery pipe until the hose joint clicks.
- Push the joint lock [B].



2-24 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

- Push and pull [A] the fuel hose joint [B] back and forth more than two times and make sure it is locked and does not come off.



WARNING

Leaking fuel can cause a fire or explosion resulting in severe burns. Make sure the fuel hose joint is installed correctly on the delivery pipe and that it doesn't leak.

- ★ If it comes off, reinstall the hose joint.
- Install the removed parts.
- Start the engine and check the fuel hose for leaks.

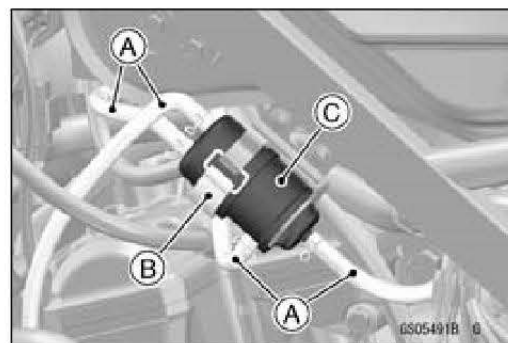
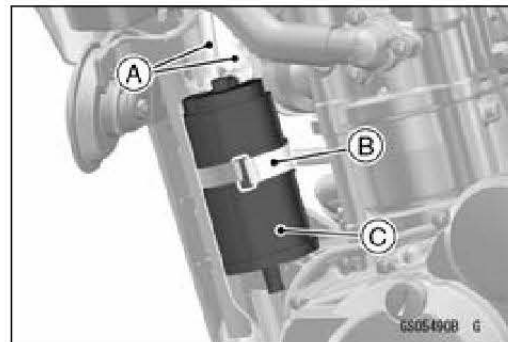
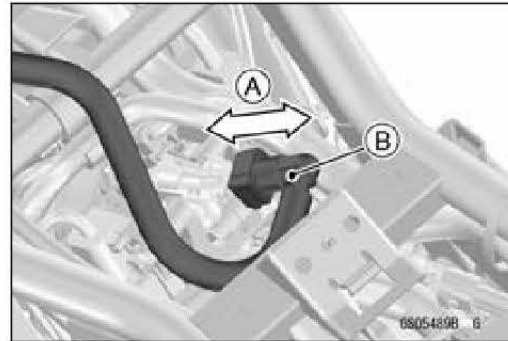
Evaporative Emission Control System Inspection (CAL Model)

- Remove:
Left Shroud (see Shroud Removal(15-10))
- Disconnect the hoses [A].
- Remove:
Band [B]
Canister [C]
- Visually inspect the canister for cracks or other damage.
- ★ If the canister has any cracks or bad damage, replace it with a new one.

NOTE

○ The canister is designed to work well through the motorcycle's life without any maintenance if it is used under normal conditions.

- Disconnect the hoses [A].
- Remove:
Band [B]
Liquid/Vapor Separator [C]
- Visually inspect the separator for cracks and other damage.
- ★ If the separator has any cracks or damage, replace it with a new one.
- To prevent the gasoline from flowing into or out of the canister, hold the separator perpendicular to the ground.
- Check that the hoses are securely connected and clamps are in position.
- ★ If necessary, replace any kinked, deteriorated or damaged hoses.
- Run the hoses correctly (see Cable, Wire, and Hose Routing section (17-2)).
- When installing the hoses, avoid sharp bending, kinking, flattening or twisting, and route the hoses with a minimum of bending so that the emission flow will not be obstructed.
- Install the removed parts.



Periodic Maintenance Procedures

Cooling System

Coolant Level Inspection

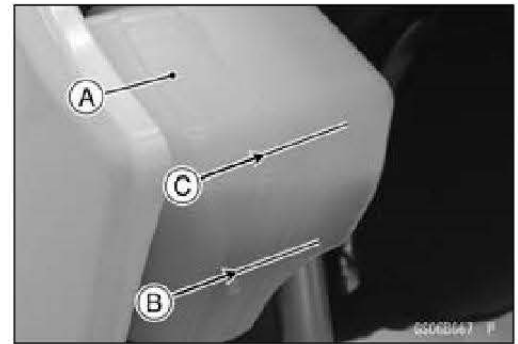
NOTE

○ Check the level when the engine is cold (room or ambient temperature).

- Check the coolant level in the reserve tank [A] with the motorcycle held perpendicular (Do not use the side stand).
- ★ If the coolant level is lower than the “L” level line [B], unscrew the reserve tank cap and add coolant to the “F” level line [C].

“L”: Low

“F”: Full



NOTICE

For refilling, add the specified mixture of coolant and soft water. Adding water alone dilutes the coolant and degrades its anticorrosion properties. The diluted coolant can attack the aluminum engine parts. In an emergency, soft water alone can be added. But the diluted coolant must be returned to the correct mixture ratio within a few days.

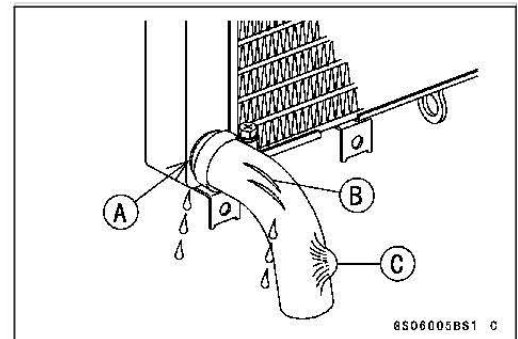
If coolant must be added often or the reservoir tank has run completely dry, there is probably leakage in the cooling system. Check the system for leaks.

Coolant ruins painted surfaces. Immediately wash away any coolant that spills on the frame, engine, wheels or other painted parts.

Cooling System Inspection

Water Hose and Pipe Inspection (coolant leak, damage, installation condition)

- The high pressure inside the water hose can cause coolant to leak [A] or the hose to burst if the line is not properly maintained.
- Visually inspect the hoses for signs of deterioration. Squeeze the hoses. A hose should not be hard and brittle, nor should it be soft or swollen.
- ★ Replace the hose if any fraying, cracks [B] or bulges [C] are noticed.
- Check that the hoses are securely connected.



Coolant Change



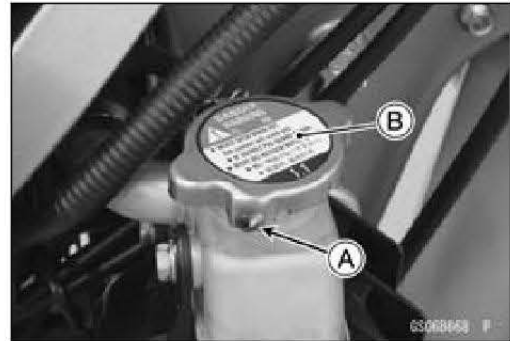
WARNING

Coolant can be extremely hot and cause severe burns, is toxic and very slippery. Do not remove the radiator cap or attempt to change the coolant when the engine is hot; allow it cool completely. Immediately wipe any spilled coolant from tires, frame, engine or other painted parts. Do not ingest coolant.

2-26 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

- Remove:
 - Coolant Reserve Tank (see [Coolant Reserve Tank Removal\(4-10\)](#))
 - Left Shroud (see [Shroud Removal\(15-10\)](#))
 - Screw [A]
 - Radiator Cap [B]



- Place a container under the coolant drain bolt [A], then remove the drain bolt.
- The coolant will drain from the radiator and engine.
- Replace the drain bolt gasket with a new one.
- Tighten the drain bolt with the gasket.

Torque - Coolant Drain Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)



- When filling the coolant, choose a suitable mixture ratio by referring to the coolant manufacturer's directions.

NOTICE

Soft or distilled water must be used with the antifreeze in the cooling system.
If hard water is used in the system, it causes scales accumulation in the water passages, and considerably reduces the efficiency of the cooling system.

Water and Coolant Mixture Ratio (Recommended)

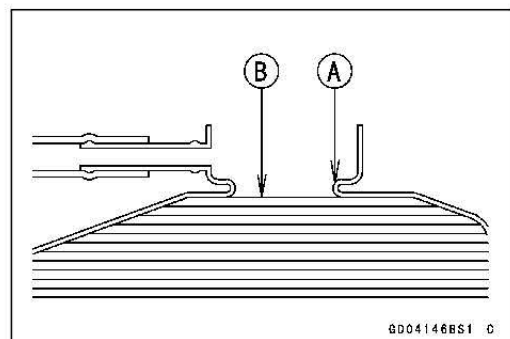
Soft Water:	50%
Coolant:	50%
Freezing Point:	-35°C (-31°F)
Total Amount:	1.2 L (1.3 US qt)

- Fill the radiator up to the filler neck [A] with coolant [B].

NOTE

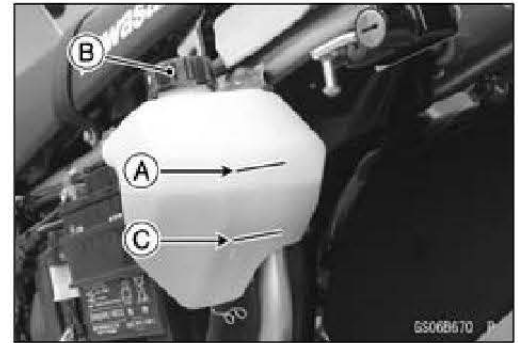
○ Pour in the coolant slowly so that it can expel the air from the engine and radiator.

- Check the cooling system for leaks.
- Tap the water hoses to force any air bubbles caught inside.
- Fill the radiator up to the filler neck with coolant.



Periodic Maintenance Procedures

- Install the coolant reserve tank (see Coolant Reserve Tank Installation(4-10)).
- Fill the reserve tank up to the “F” (full) level line [A] with coolant and install the cap [B].
- Install the radiator cap.
- Start the engine, warm it up thoroughly until the radiator fan turns on and then stop the engine.
- Check the coolant level in the reserve tank after the engine cools down.
- ★ If the coolant level is lower than the “L” (low) level line [C], add coolant to the “F” level line.



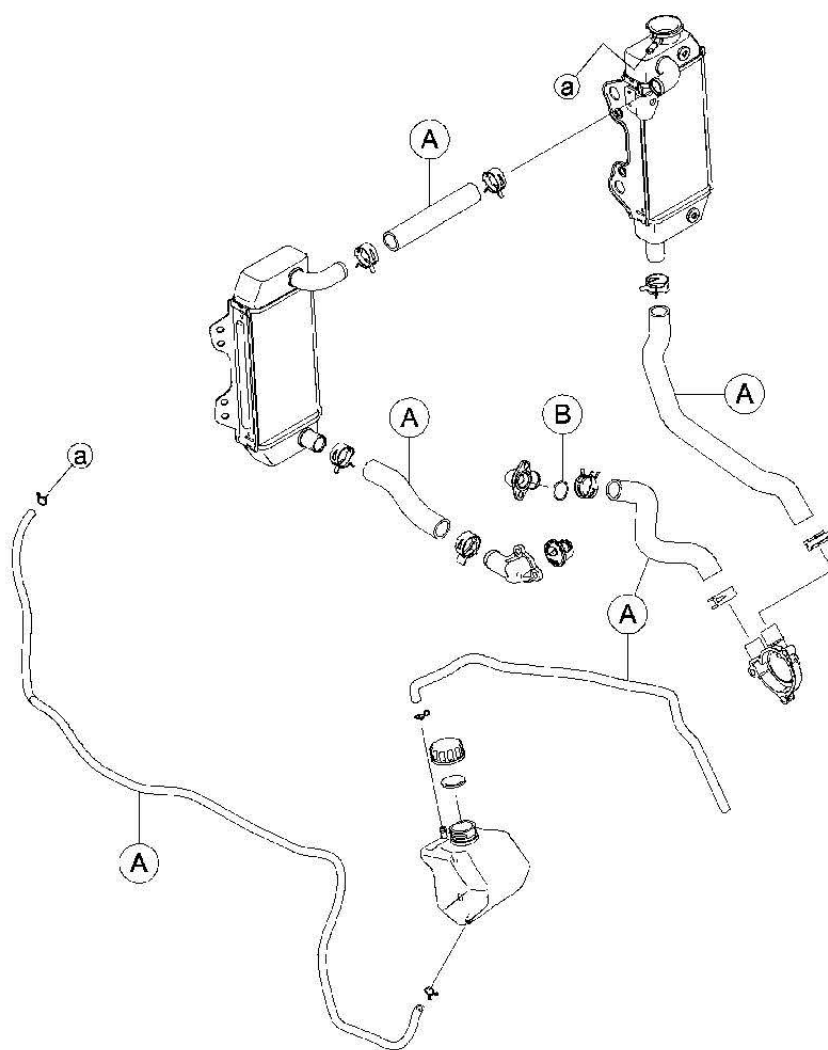
<i>NOTICE</i>
Do not add more coolant above the “F” level line.

2-28 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

Water Hose and O-ring Replacement

- Drain the coolant (see [Coolant Change\(2-25\)](#)).
- Remove:
 - Fuel Tank (see [Fuel Tank Removal\(3-113\)](#))
 - Rear Frame Cover (see [Rear Frame Cover Removal\(15-8\)](#))
 - Hoses [A]
 - O-ring [B]
- Replace the hoses and O-ring with new ones.
- Apply grease to the new O-ring.
- Run the new hoses correctly (see [Cable, Wire, and Hose Routing section \(17-2\)](#)).
- Install the removed parts.
- Fill the coolant (see [Coolant Change\(2-25\)](#)).
- Check the cooling system for leaks.



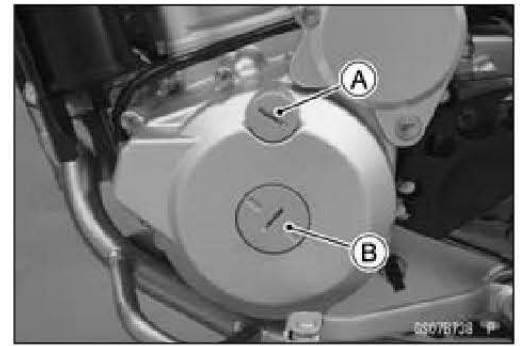
Periodic Maintenance Procedures

Engine Top End

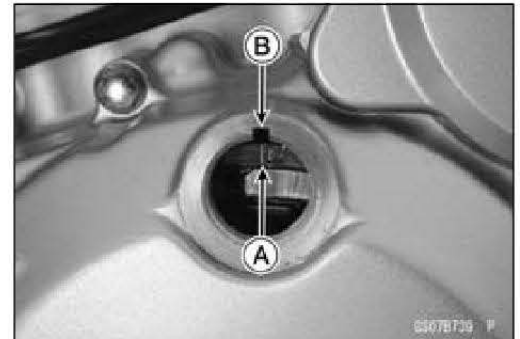
Valve Clearance Inspection

- Remove:
 - Cylinder Head Cover (see Cylinder Head Cover Removal(5-14))
 - Timing Inspection Cap [A]
 - Alternator Rotor Nut Cap [B]

Special Tool - Filler Cap Driver: 57001-1454



- Bring the piston to the TDC of its compression stroke to inspect the valve clearance (the position at the end of the compression stroke), when the cam lobe faces outside of the camshaft.
- Place a wrench over the alternator rotor nut and turn it counterclockwise to align the TDC mark [A] with the center of the groove [B] of the inspection hole.



- Using a thickness gauge [A], measure the clearance between each cam lobe and valve lifter for all 4 valves.
- For the purpose of adjusting the valve clearances, record the measured values.



Valve Clearance

Standard:

Exhaust	0.15 ~ 0.24 mm (0.0059 ~ 0.0094 in.)
Intake	0.10 ~ 0.19 mm (0.0039 ~ 0.0075 in.)

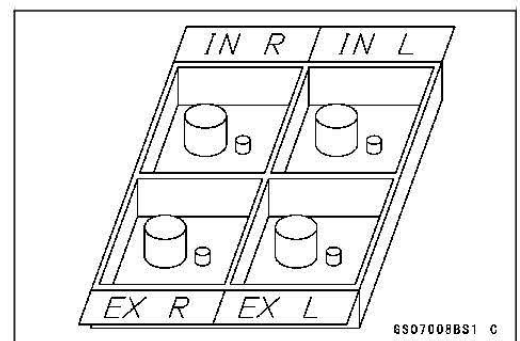
- ★ If the valve clearance is not within the specified range, adjust it.

Valve Clearance Adjustment

- To change the valve clearance, remove the camshaft chain tensioner, camshafts and valve lifters. Replace the shim with one of a different thickness.

NOTE

- Mark and record the locations of the valve lifters and shims so that they can be reinstalled in their original positions.



- Clean the shim to remove any dust or oil.
- Measure the thickness of the removed shim [A].



2-30 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

VALVE CLEARANCE ADJUSTMENT CHART INTAKE VALVE

		Present Shim										Example											
Part No. (92180-)		1014	1016	1018	1020	1022	1024	1026	1028	1030	1032	1034	1036	1038	1040	1042	1044	1046	1048	1050	1052	1054	
Mark		50	55	60	65	70	75	80	85	90	95	00	05	10	15	20	25	30	35	40	45	50	
Thickness (mm)		2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	

Valve Clearance Measurement (mm)	0.00~0.04	-	-	-	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35
	0.05~0.09	-	-	2.50	2.65	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40
	0.10~0.14	Specified Clearance / No Change Required																				
	0.15~0.19																					
	0.20~0.24	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	
	0.25~0.29	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50		
	0.30~0.34	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50			
	0.35~0.39	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50				
	0.40~0.44	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50					
	0.45~0.49	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50						
	0.50~0.54	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50							
	0.55~0.59	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50								
	0.60~0.64	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50									
	0.65~0.69	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50										
	0.70~0.74	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50											
	0.75~0.79	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50												
	0.80~0.84	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50													
	0.85~0.89	3.20	3.25	3.30	3.35	3.40	3.45	3.50														
	0.90~0.94	3.25	3.30	3.35	3.40	3.45	3.50															
	0.95~0.99	3.30	3.35	3.40	3.45	3.50																
	1.00~1.04	3.35	3.40	3.45	3.50																	
	1.05~1.09	3.40	3.45	3.50																		
	1.10~1.14	3.45	3.50																			
	1.15~1.19	3.50																				

Install the shim of this thickness (mm)

6E15162B S

1. Measure the clearance (when engine is cold).
2. Check present shim size.
3. Match clearance in vertical column with present shim size in horizontal column.
4. Install the shim specified where the lines intersect. This shim will give the proper clearance.

Example:

Present shim is **2.95 mm**.

Measured clearance is **0.36 mm**.

Replace **2.95 mm** shim with **3.15 mm** shim.

5. Remeasure the valve clearance and readjust if necessary.

Periodic Maintenance Procedures

VALVE CLEARANCE ADJUSTMENT CHART EXHAUST VALVE

		Present Shim																Example							
Part No. (92180-)		1014	1016	1018	1020	1022	1024	1026	1028	1030	1032	1034	1036	1038	1040	1042	1044	1046	1048	1050	1052	1054			
Mark		50	55	60	65	70	75	80	85	90	95	00	05	10	15	20	25	30	35	40	45	50			
Thickness (mm)		2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50			

Valve Clearance Measurement (mm)	0.00~0.04	-	-	-	-	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50
	0.05~0.09	-	-	-	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50	
Example	0.10~0.14	-	-	2.50	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50		
	0.14~0.19	Specified Clearance / No Change Required																								
Example	0.20~0.24																									
	0.25~0.29	2.55	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50					
Example	0.30~0.34	2.60	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50						
	0.35~0.39	2.65	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50							
Example	0.40~0.44	2.70	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50								
	0.45~0.49	2.75	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50									
Example	0.50~0.54	2.80	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50										
	0.55~0.59	2.85	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50											
Example	0.60~0.64	2.90	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50												
	0.65~0.69	2.95	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50													
Example	0.70~0.74	3.00	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50														
	0.75~0.79	3.05	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50															
Example	0.80~0.84	3.10	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50																
	0.85~0.89	3.15	3.20	3.25	3.30	3.35	3.40	3.45	3.50																	
Example	0.90~0.94	3.20	3.25	3.30	3.35	3.40	3.45	3.50																		
	0.95~0.99	3.25	3.30	3.35	3.40	3.45	3.50																			
Example	1.00~1.04	3.30	3.35	3.40	3.45	3.50																				
	1.05~1.09	3.35	3.40	3.45	3.50																					
Example	1.10~1.14	3.40	3.45	3.50																						
	1.15~1.19	3.45	3.50																							
Example	1.20~1.24	3.50																								

Install the shim of this thickness (mm)

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1. Measure the clearance (when engine is cold).
2. Check present shim size.
3. Match clearance in vertical column with present shim size in horizontal column.
4. Install the shim specified where the lines intersect. This shim will give the proper clearance.

Example: Present shim is **3.10 mm**.
 Measured clearance is **0.36 mm**.
 Replace **3.10 mm** shim with **3.25 mm** shim.

5. Remeasure the valve clearance and readjust if necessary.

2-32 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

NOTICE

Be sure to remeasure the clearance after selecting a shim according to the table. If the clearance is out of the specified range, use the additional shim.

- If there is no valve clearance, use a shim that is a few sizes smaller, and remeasure the valve clearance.
- When installing the shim, face the marked side toward the valve lifter. At this time, apply engine oil to the shim or the valve lifter to keep the shim in place during camshaft installation.

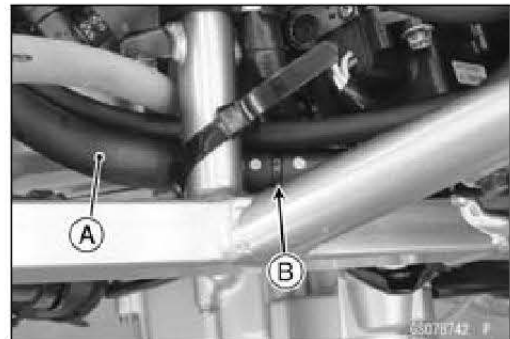
NOTICE

Do not put shim stock under the shim. This may cause the shim to pop out at high rpm, causing extensive engine damage.
Do not grind the shim. This may cause it to fracture, causing extensive engine damage.

- Apply engine oil to the valve lifter surface and install the lifter.
- Install the camshafts (see Camshaft Installation(5-19)).
- Recheck the valve clearance and readjust if necessary.
- Install the removed parts.

Air Suction System Damage Inspection

- Remove the fuel tank (see Fuel Tank Removal(3-113)).
- Separate the air switching valve hose [A] from the hose fitting [B].



- Install the fuel tank temporary (see Fuel Tank Installation(3-115)).
- Start the engine and run it at idle speed.
- Plug the air switching valve hose end [A] with your finger and feel vacuum pulsing in the hose.
- ★ If there is no vacuum pulsation, check the hose line for leak.
- ★ If there is no leak, check the air switching valve (see Air Switching Valve Unit Test(16-61)).



Spark Arrester Cleaning

This motorcycle is equipped with a spark arrester approved for off-road use by U.S. Forest Service. It must be properly maintained to ensure its efficiency.

⚠ WARNING

The muffler can become extremely hot during normal operation and cause severe burns. Since the engine must be running during this procedure, wear heat-resistant gloves while cleaning the spark arrester.

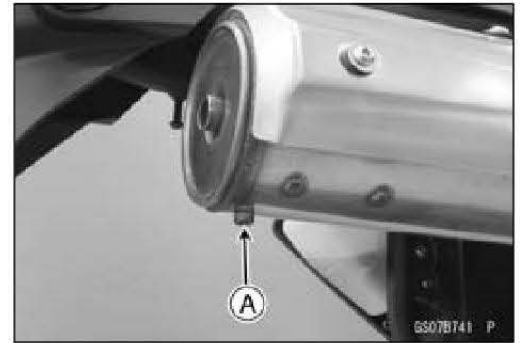
Periodic Maintenance Procedures

- Remove the drain plug [A].
- In open area away from combustible materials, start the engine with the transmission in neutral.
- Raise and lower engine speed while tapping on the muffler body with a rubber mallet until carbon particles are purged from the muffler.

⚠ DANGER

Exhaust gas contains carbon monoxide, a colorless, odorless poisonous gas. Inhaling carbon monoxide can cause serious brain injury or death. **DO NOT** run the engine in enclosed areas. Operate only in a well-ventilated area.

- Stop the engine.
- Tighten the drain plug securely.



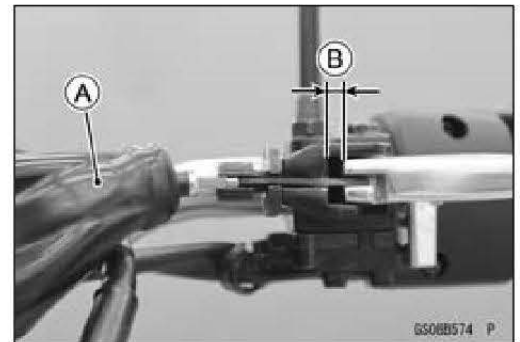
Clutch

Clutch Operation Inspection

- (KLX300D) Turn over the dust cover [A].
- Pull the clutch lever just enough to take up the free play [B].
- Measure the gap between the lever and the lever holder.
- ★ If the gap is too wide, the clutch may not release fully. If the gap is too narrow, the clutch may not engage fully. In either case, adjust it.

Clutch Lever Free Play

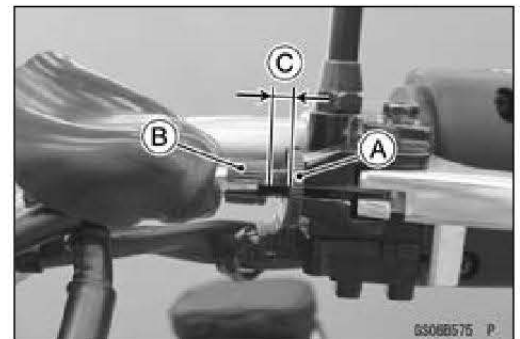
Standard: 2 ~ 3 mm (0.08 ~ 0.12 in.)



⚠ WARNING

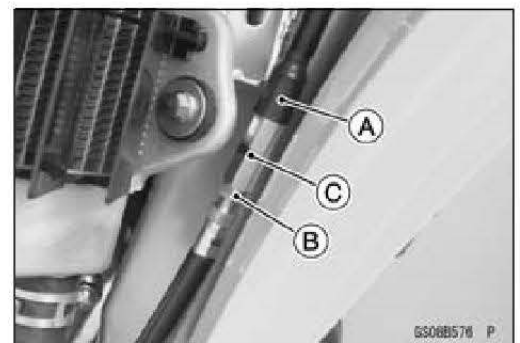
The engine and exhaust system get extremely hot during normal operation and can cause serious burns. Never touch the engine or exhaust pipe during clutch adjustment.

- Loosen the locknut [A].
- Turn the adjuster [B] so that 5 ~ 6 mm (0.20 ~ 0.24 in.) [C] of threads is visible.
- Slide the dust cover [A] at the clutch cable.
- Loosen the locknut [B] at the middle of the clutch cable.
- Turn the adjuster [C] at the clutch cable until the free play is correct.
- (KLX300D) Install the dust cover to the original place.



⚠ WARNING

Too much cable play can prevent clutch disengagement and cause an accident resulting in serious injury or death. When adjusting the clutch or replacing the cable, be sure the upper end of the clutch outer cable is fully seated in its fitting, or it could slip into place later, creating enough cable play to prevent clutch disengagement.



- After the adjustment, start the engine and check that the clutch does not slip and that it releases properly.

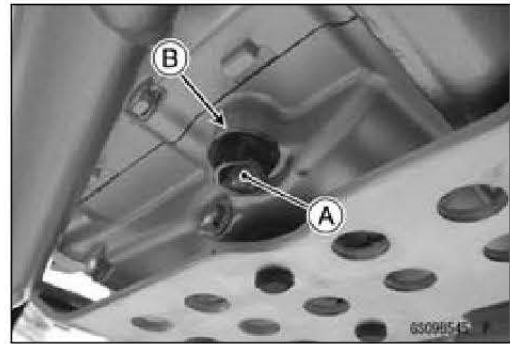
2-34 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

Engine Lubrication System

Engine Oil Change

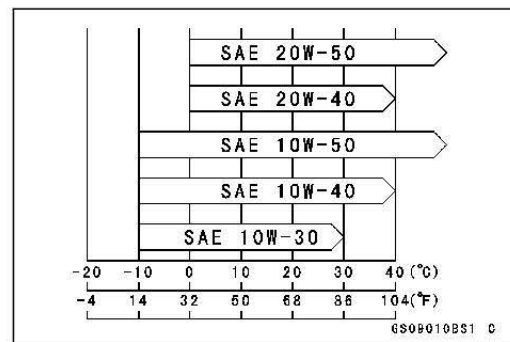
- Situate the motorcycle so that it is vertical after warming up the engine.
- Remove the engine oil drain bolt [A] to drain the oil.
- The oil in the oil filter can be drained by removing the filter (see Oil Filter Replacement(2-35)).
- Replace the drain bolt gasket [B] with a new one.
- Tighten:
Torque - Engine Oil Drain Bolt: 15 N·m (1.5 kgf·m, 11 ft·lb)
- Remove the oil filler plug [A].



- Pour in the specified type and amount of oil.

Recommended Engine Oil

- Type: API SG, SH, SJ, SL or SM with JASO MA, MA1 or MA2
- Viscosity: SAE 10W-40
- Capacity: 1.0 L (1.1 US qt) (when filter is not removed)
1.1 L (1.2 US qt) (when filter is removed)
1.3 L (1.4 US qt) (when engine is completely dry)



NOTE

- Do not add any chemical additive to the oil. Oils fulfilling the above requirements are fully formulated and provide adequate lubrication for both the engine and the clutch.
- Although 10W-40 engine oil is the recommended oil for most conditions, the oil viscosity may need to be changed to accommodate atmospheric conditions in your riding area.
- Replace the O-ring of the oil filler plug with a new one.
- Apply grease to the new O-ring.
- Install the oil filler plug.
- Check the oil level (see Oil Level Inspection(7-8)).

Periodic Maintenance Procedures

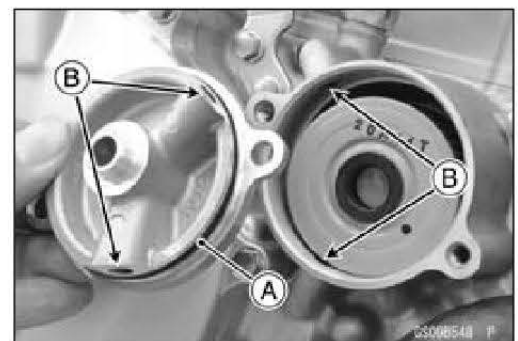
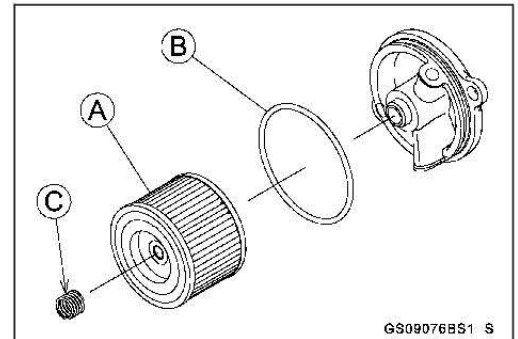
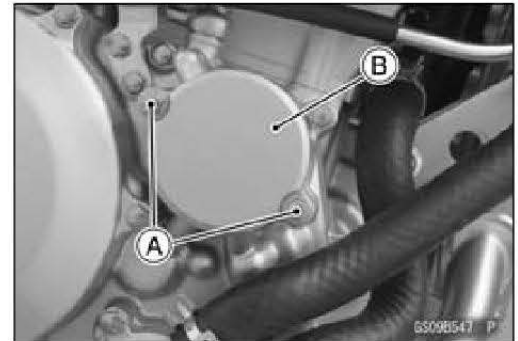
Oil Filter Replacement

- Drain the engine oil (see Engine Oil Change(2-34)).
- Remove:
 - Oil Filter Cap Bolts [A]
 - Oil Filter Cap [B]
 - Oil Filter
 - Spring
- Replace the oil filter [A] and O-ring [B] with new ones.
- Apply grease to the spring [C] so that it may stay in place without falling off from the oil filter.
- Install the oil filter with the grommet side facing out.

NOTICE

If the filter is put in the wrong direction, it blocks oil from flowing to the engine and causes an engine seizure.

- Apply grease to the O-ring [A].
- Install the oil filter cap so that the align the oil passage holes [B] of the oil filter cap and clutch cover.
- Tighten:
 - Torque - Oil Filter Cap Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)**
- Pour in the specified type and amount of oil (see Engine Oil Change(2-34)).



Wheels/Tires

Air Pressure Inspection

- Remove the air valve cap.
- Measure the tire air pressure with an air pressure gauge [A] when the tires are cold (that is, when the motorcycle has not been ridden more than a mile during the past 3 hours).
- Install the air valve cap.
- ★ Adjust the tire air pressure according to the specifications if necessary.

Air Pressure (when Cold)

KLX300D:

Front 150 kPa (1.50 kgf/cm², 22 psi)

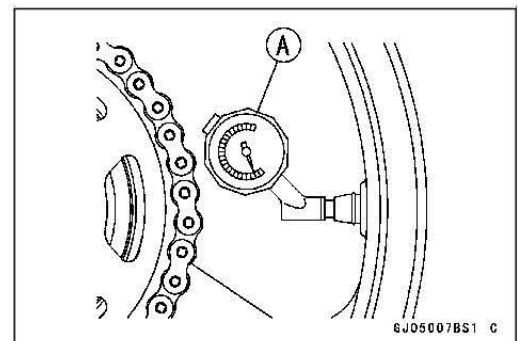
Rear Up to 97.5 kg (215 lb) load: 150 kPa (1.50 kgf/cm², 22 psi)

97.5 ~ 184 kg (215 ~ 406 lb) load: 175 kPa (1.75 kgf/cm², 25 psi)

KLX300E:

Front 200 kPa (2.00 kgf/cm², 29 psi)

Rear 225 kPa (2.25 kgf/cm², 33 psi)



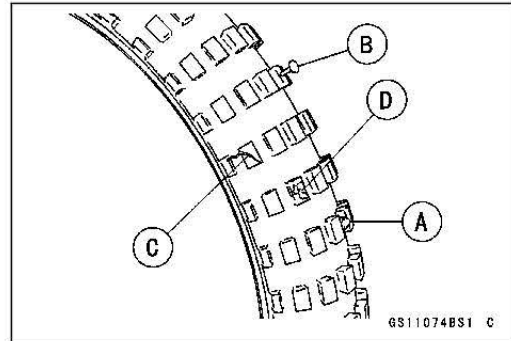
2-36 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

Wheels and Tires Inspection

Wheel/Tire Damage Inspection

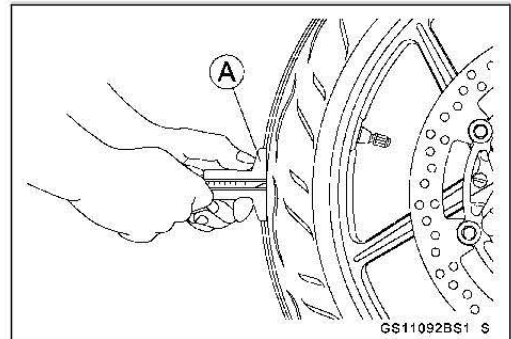
- Remove any imbedded stones [A] or other foreign particles [B] from tread.
 - Visually inspect the tire for cracks [C] and cuts [D], and replace the tire if necessary. Swelling or high spots indicate internal damage, requiring tire replacement.
 - Visually inspect the wheel for cracks, cuts and dents damage.
- ★ If any damage is found, replace the wheel if necessary.



Tire Tread Wear Inspection

As the tire tread wears down, the tire becomes more susceptible to puncture and failure. An accepted estimate is that 90% of all tire failures occur during the last 10% of tread life (90% worn). So it is false economy and unsafe to use the tires until they are bald.

- Measure the tread depth at the center of the tread with a depth gauge [A]. Since the tire may wear unevenly, take measurement at several places.
- ★ If any measurement is less than the service limit, replace the tire.



Tread Depth

KLX300D:

Standard:

Front	7.8 mm (0.31 in.)
Rear	11.8 mm (0.46 in.)

Service Limit:

Front	2 mm (0.08 in.)
Rear	2 mm (0.08 in.)

KLX300E:

Standard:

Front	4.4 mm (0.17 in.)
Rear	6.5 mm (0.26 in.)

Service Limit:

Front	1 mm (0.04 in.)
Rear	Up to 130 km/h (80 mph), 2 mm (0.08 in.) Over 130 km/h (80 mph), 3 mm (0.12 in.)

⚠ WARNING

Some replacement tires may adversely affect handling and cause an accident resulting in serious injury or death. To ensure proper handling and stability, use only the recommended standard tires for replacement, inflated to the standard pressure.

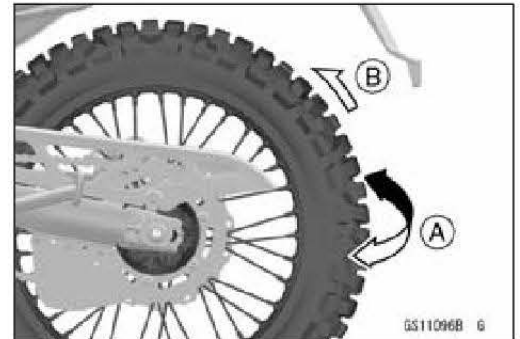
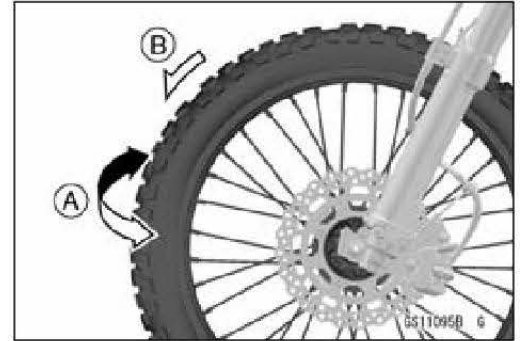
NOTE

- Most countries may have their own regulations a minimum tire tread depth: be sure to follow them.
- Check and balance the wheel when a tire is replaced with a new one.

Periodic Maintenance Procedures

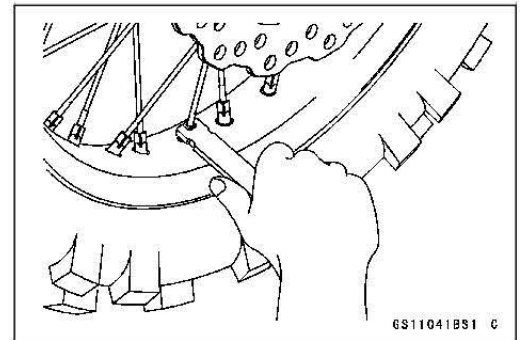
Wheel Bearing Damage Inspection

- Raise the front wheel off the ground with the stand or the jack (see [Front Wheel Removal\(10-7\)](#)).
 - Turn the handlebars all the way to the right or left.
 - Inspect the roughness of the front wheel bearing by pushing and pulling [A] the wheel.
 - Spin [B] the front wheel lightly, and check for smoothly turn, roughness, binding or noise.
 - ★ If roughness, binding or noise is found, remove the front wheel (see [Front Wheel Removal\(10-7\)](#)) and inspect the wheel bearing (see [Hub Bearing Inspection\(10-16\)](#)).
-
- Raise the rear wheel off the ground with the stand or the jack (see [Rear Wheel Removal\(10-9\)](#)).
 - Inspect the roughness of the rear wheel bearing by pushing and pulling [A] the wheel.
 - Spin [B] the rear wheel lightly, and check for smoothly turn, roughness, binding or noise.
 - ★ If roughness, binding or noise is found, remove the rear wheel (see [Rear Wheel Removal\(10-9\)](#)) and inspect the wheel bearing (see [Hub Bearing Inspection\(10-16\)](#)).



Spoke Tightness and Rim Runout Inspection

- Check that all the spokes are tightened evenly.
 - ★ If spoke tightness is uneven or loose, tighten the spoke nipples evenly.
- Torque - Spoke Nipples: 4.0 N·m (0.41 kgf·m, 35 in·lb)**
- Check the rim runout.



WARNING

A missing spoke places an additional load on the other spokes, which will eventually cause other spokes to break, creating the potential for an accident resulting in serious injury or death. Immediately replace any broken spoke(s).

2-38 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

- Raise the wheel off the ground with the stand or the jack (see [Front Wheel Removal\(10-7\)](#)) (see [Rear Wheel Removal\(10-9\)](#)).
- Inspect the rim for small cracks, dents, bending, or warping.
- ★ If there is any damage to the rim, it must be replaced.
- Set a dial gauge against the side of the rim, and rotate the rim to measure the axial runout [A]. The difference between the highest and lowest dial readings is the amount of runout.
- Set a dial gauge against the outer circumference of the rim, and rotate the rim to measure radial runout [B]. The difference between the highest and lowest dial readings is the amount of runout.
- ★ If rim runout exceeds the service limit, check the wheel bearings first. Replace them if they are damaged. If the problem is not due to the bearings, correct the rim warp (runout). A certain amount of rim warp can be corrected by recentering the rim. Loosen some spokes and tighten others within the standard torque to change the position of different parts of the rim. If the rim is badly bent, however, it must be replaced.

Rim Runout (with tire installed)

Standard:

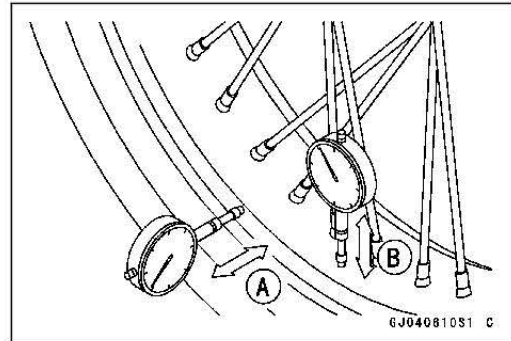
Axial TIR 1.0 mm (0.04 in.) or less

Radial TIR 1.0 mm (0.04 in.) or less

Service Limit:

Axial TIR 2.0 mm (0.08 in.)

Radial TIR 2.0 mm (0.08 in.)



Final Drive

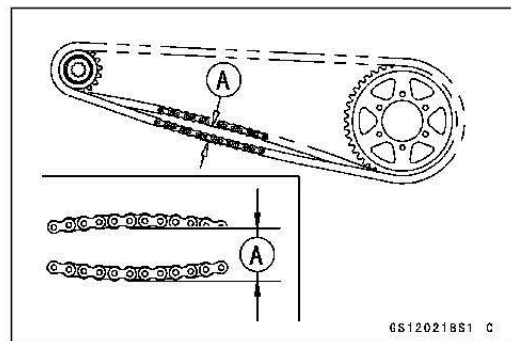
Drive Chain Slack Inspection

NOTE

- Check the slack with the motorcycle setting on its side stand.
- Clean the chain if it is dirty, and lubricate it if it appears dry.
- Check the wheel alignment (see [Wheel Alignment Inspection\(2-39\)](#)).
- Rotate the rear wheel to find the position where the chain is tightest.
- Measure the vertical movement (chain slack) [A] midway between the sprockets.
- ★ If the chain slack exceeds the standard, adjust it.

Chain Slack

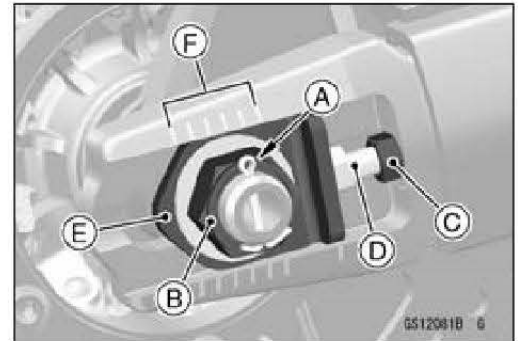
Standard: 30 ~ 40 mm (1.2 ~ 1.6 in.)



Periodic Maintenance Procedures

Drive Chain Slack Adjustment

- Remove the cotter pin [A], and loosen the axle nut [B].
- Loosen the both chain adjuster locknuts [C].
- ★ If the chain is too loose, turn out the right and left chain adjusters [D] evenly.
- ★ If the chain is too tight, turn in the right and left chain adjusters evenly, and push the wheel forward.
- Turn both chain adjusters evenly until the drive chain has the correct amount of slack.
- To keep the chain and wheel properly aligned, the left wheel alignment indicator [E] should align with the same swingarm mark [F] that the right wheel alignment indicator aligns with.



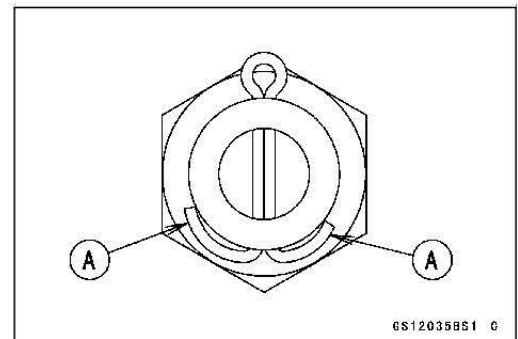
WARNING

Misalignment of the wheel will result in abnormal wear and may result in an unsafe riding condition. Be sure the wheel is properly aligned.

- Tighten both chain adjuster locknuts securely.
- Tighten:
Torque - Rear Axle Nut: 110 N·m (11.2 kgf·m, 81.1 ft·lb)
- Turn the wheel, measure the chain slack again at the tightest position, and readjust if necessary.
- Replace the cotter pin with a new one.
- Bend its ends [A] along the axle.

WARNING

A loose axle nut can lead to an accident resulting in serious injury or death. Tighten the axle nut to the proper torque and install a new cotter pin.

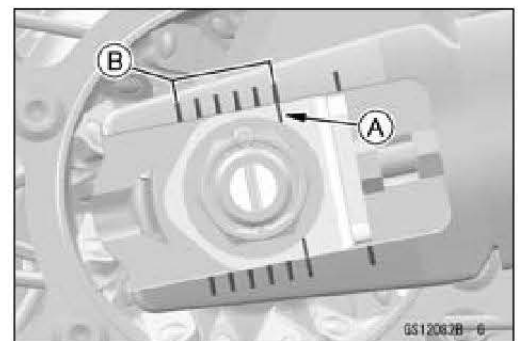


Wheel Alignment Inspection

- Check that the notch [A] on the right alignment indicator aligns with the same swingarm mark [B] that the notch on the left alignment indicator aligns with.
- ★ If they are not, adjust the chain slack and align the wheel alignment (see Drive Chain Slack Adjustment(2-39)).

NOTE

- Wheel alignment can be also checked using the straightedge or string method.



WARNING

Misalignment of the wheel will result in abnormal wear and may result in an unsafe riding condition. Be sure the wheel is properly aligned.

2-40 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

Drive Chain Lubrication Condition Inspection

Lubrication is necessary after riding through rain or on wet roads, or any time that the chain appears dry.

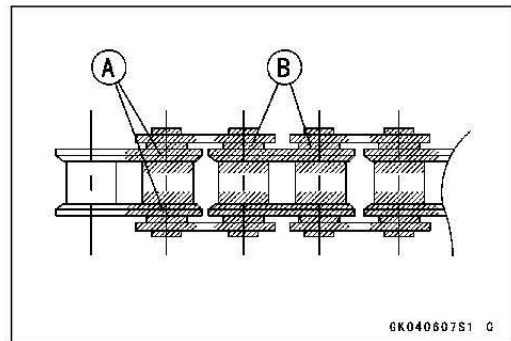
Use a lubricant for sealed chains to prevent deterioration of chain seals. If the chain is especially dirty, clean it using a cleaner for sealed chains following the instructions supplied by the chain cleaner manufacturer.

NOTICE

The O-rings between the side plates seal in the lubricant between the pin and the bushing. To avoid damaging the O-rings and resultant loss of lubricant, observe the following rules.

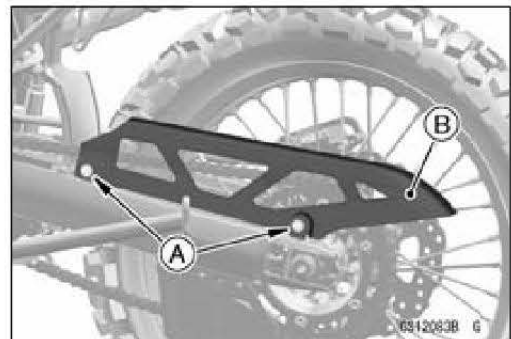
Use only chain cleaner for cleaning of the O-ring of the drive chain. Any other cleaning solution such as gasoline will cause deterioration and swelling of the O-ring. Immediately blow the chain dry with compressed air after cleaning. Complete cleaning and drying the chain within 10 minutes.

- Apply chain oil to the sides of the rollers so that oil will penetrate to the rollers and bushings. Apply the oil to the O-rings so that the O-rings will be coated with oil.
- Wipe off any excess oil.
 - Oil Applied Areas [A]
 - O-rings [B]
- Wipe off lubricant that gets on the tire surface.

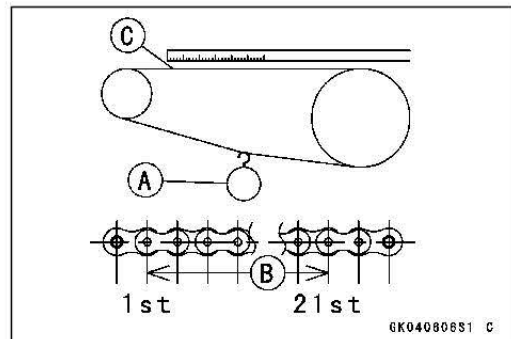


Drive Chain Wear Inspection

- Remove:
 - Bolts [A]
 - Chain Cover [B]
- Rotate the rear wheel to inspect the drive chain for damaged rollers, and loose pins and links.
- ★ If there is any irregularity, replace the drive chain.
- ★ Lubricate the drive chain if it appears dry.



- Stretch the chain taut by hanging a 10 kg (22 lb) weight [A] on the chain.
- Measure the length of 20 links [B] on the straight part [C] of the chain from the pin center of the 1st pin to the pin center of the 21st pin. Since the chain may wear unevenly, take measurements at several places.
- ★ If any measurements exceed the service limit, replace the chain. Also, replace the front and rear sprockets when the drive chain is replaced.



Drive Chain 20-link Length

Standard: 317.5 ~ 318.2 mm (12.50 ~ 12.53 in.)

Service Limit: 319 mm (12.6 in.)

Periodic Maintenance Procedures

WARNING

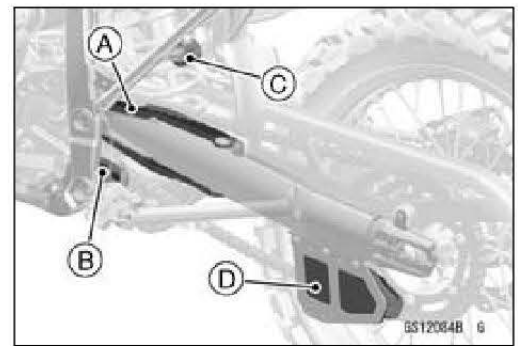
A chain that breaks or jumps off the sprockets could snag on the engine sprocket or lock the rear wheel, severely damaging the motorcycle and causing it to go out of control. Inspect the chain for damage and proper adjustment before each ride. If chain wear exceeds the service limit, replace it with the standard chain.

Standard Chain

Make: ENUMA
Type: EK520LVO3 (when shipping)
 EK520SRO2
Link: (KLX300D) 106 links
 (KLX300E) 104 links

Chain Guide Wear Inspection

- Remove:
 Engine Sprocket Cover (see Engine Sprocket Removal(11-10))
- Visually inspect the following parts.
 Chain Guide [A]
 Lower Chain Guide [B]
 Upper Chain Guide [C]
 Rear Chain Guide [D]
- ★ If the chain guide(s) shows any signs of abnormal wear or damage, replace it with a new one.

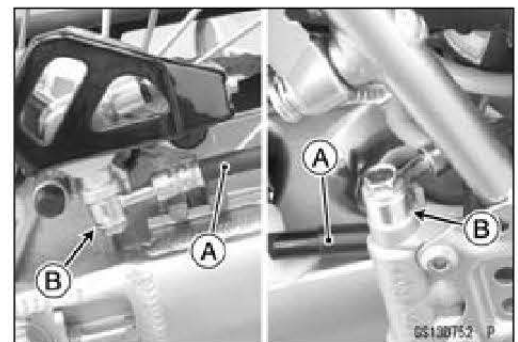
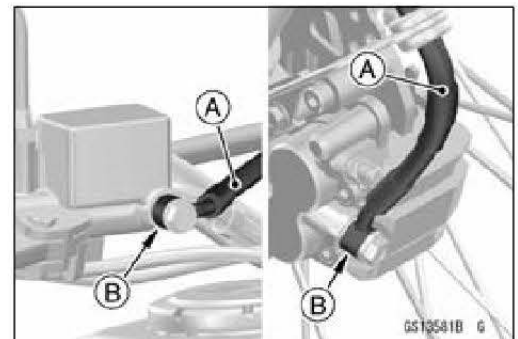


Brakes

Brake System Inspection

Brake Fluid Leak Inspection

- Apply the brake lever or pedal and inspect the brake fluid leak from the brake hoses [A] and fittings [B].
- ★ If the brake fluid leaked from any position, inspect or replace the problem part.



2-42 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

Brake Hose Damage and Installation Condition Inspection

- Inspect the brake hoses and fittings for deterioration, cracks and signs of leakage.
- The high pressure inside the brake line can cause fluid to leak [A] or the hose to burst if the line is not properly maintained. Bend and twist the rubber hose while examining it.
- ★ Replace the hose if any crack [B], bulge [C] or leakage is noticed.
- ★ Tighten any brake hose banjo bolts.

Torque - Brake Hose Banjo Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)

- Inspect the brake hose routing (see Cable, Wire, and Hose Routing section (17-2)).
- ★ If any brake hose and pipe routing is incorrect, run the brake hose and pipe correctly.

Brake Operation Inspection

- Inspect the operation of the front and rear brake by running the vehicle on the dry road.
- ★ If the brake operation is insufficiency, inspect the brake system.



WARNING

When test riding the vehicle, be aware of surrounding traffic for your safety.

Brake Fluid Level Inspection

- Check that the brake fluid level in the front brake reservoir [A] is above the lower level line [B].

NOTE

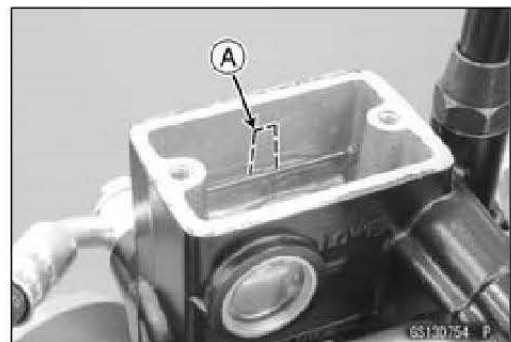
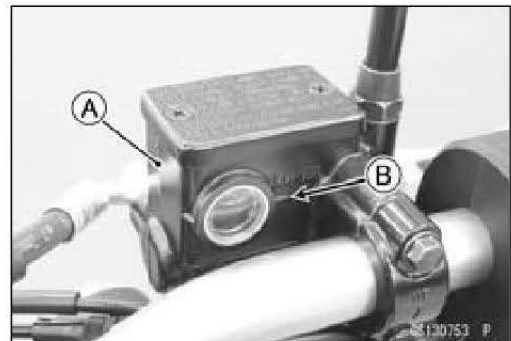
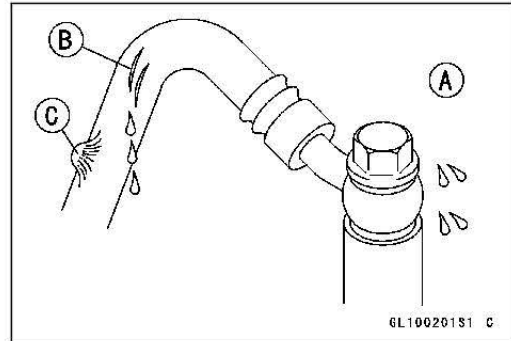
○ Hold the reservoir horizontal by turning the handlebars when checking brake fluid level.

NOTICE

Brake fluid quickly damages painted plastic surfaces; any spilled fluid should be completely washed away immediately.

- ★ If the fluid level is lower than the lower level line, fill the reservoir to the upper level line [A].
- Tighten:

Torque - Brake Reservoir Cap Screws: 1.5 N·m (0.15 kgf·m, 13 in·lb)



Periodic Maintenance Procedures

- Check that the brake fluid level in the rear brake reservoir [A] is above the lower level line [B].

NOTICE

Brake fluid quickly damages painted plastic surfaces; any spilled fluid should be completely washed away immediately.

- ★ If the fluid level is lower than the lower level line, fill the reservoir to the upper level line [C].
- Tighten:

Torque - Brake Reservoir Cap Screws: 1.5 N·m (0.15 kgf·m, 13 in·lb)



WARNING

Mixing brands and types of brake fluid can reduce the brake system's effectiveness and cause an accident resulting in injury or death. Do not mix two brands of brake fluid. Change the brake fluid in the brake line completely if the brake fluid must be re-filled but the type and brand of the brake fluid that is already in the reservoir are unidentified.

Recommended Disc Brake Fluid

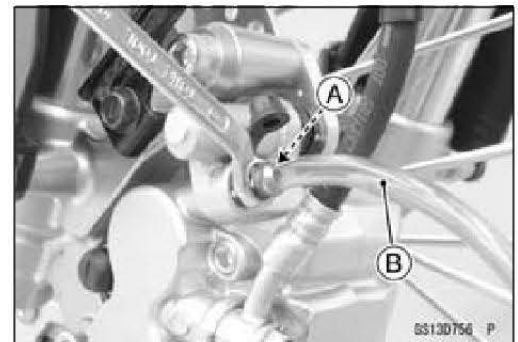
Grade: DOT3 or DOT4

Brake Fluid Change

NOTE

○ The procedure to change the front brake fluid is as follows. Changing the rear brake fluid is the same as for the front brake.

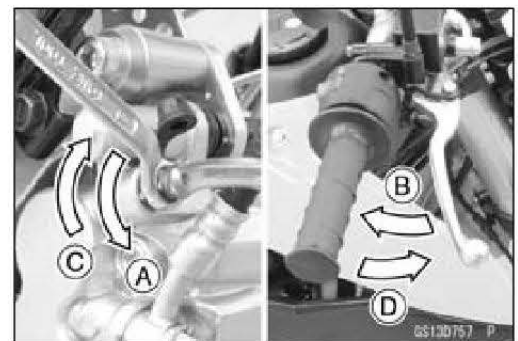
- Level the brake fluid reservoir.
- Remove the reservoir cap, diaphragm plate and diaphragm.
- Open rubber cap from the bleed valve [A].
- Attach a clear plastic hose [B] to the bleed valve, and run the other end of the hose into a container.
- Fill the reservoir with fresh specified brake fluid.



- Change the brake fluid.
- Repeat this operation until fresh brake fluid comes out from the plastic hose or the color of the fluid changes.
 1. Open the bleed valve [A].
 2. Apply the brake and hold it [B].
 3. Close the bleed valve [C].
 4. Release the brake [D].

NOTE

○ The fluid level must be checked often during the changing operation and replenished with fresh brake fluid. If the fluid in the reservoir runs out any time during the changing operation, the brakes will need to be bled since air will have entered the brake line.



2-44 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

- Remove the clear plastic hose.
- Install the diaphragm, diaphragm plate and reservoir cap.

Torque - Brake Reservoir Cap Screws: 1.5 N·m (0.15 kgf·m, 13 in·lb)

- Tighten the bleed valve, and install the rubber cap.

Torque - Caliper Bleed Valve: 7.8 N·m (0.80 kgf·m, 69 in·lb)

- After changing the fluid, check the brake for good braking power, no brake drag, and no fluid leakage.

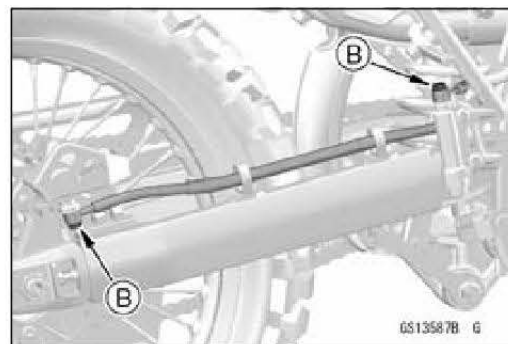
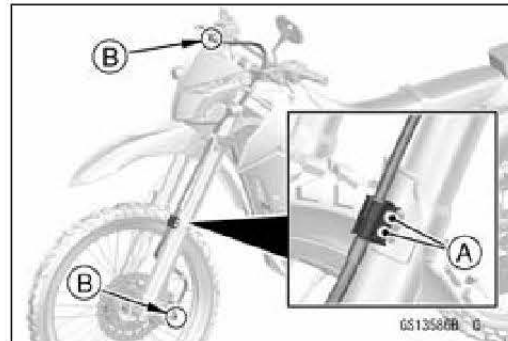
★ If necessary, bleed the air from the lines.

Brake Hose Replacement

NOTICE

Brake fluid quickly damages painted plastic surfaces; any spilled fluid should be completely washed away immediately.

- Remove:
 - Bolts [A] and Hose Clamps
 - Brake Hose Banjo Bolts [B]
- When removing the brake hoses, note the following.
 - Take care not to spill the brake fluid on the painted or plastic parts.
 - Temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.
 - Immediately wash away any brake fluid that spills.
- When installing the brake hoses, note the following.
 - Avoid sharp bending, kinking, flattening or twisting, and run the hoses correctly (see Cable, Wire, and Hose Routing section (17-2)).
 - There are washers on each side of the brake hose fitting. Replace them with new ones.
- Run the brake hoses correctly (see Cable, Wire, and Hose Routing section (17-2)).
- Tighten:
 - **Torque - Brake Hose Banjo Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)**
- Fill the brake line after installing the brake hose (see Brake Fluid Change(2-43)).



Periodic Maintenance Procedures

Master Cylinder Rubber Parts Replacement Front Master Cylinder Disassembly

- Remove:
 - Front Master Cylinder (see Front Master Cylinder Removal(12-18))
 - Brake Reservoir Cap Screws [A] and Cap [B]
 - Diaphragm Plate [C] and Diaphragm [D]
 - Brake Lever Pivot Bolt Locknut [E]
 - Brake Lever Pivot Bolt [F]
 - Brake Lever [G]
 - Dust Cover [H]
 - Circlip [I]
 - Washer [J]

Special Tool - Inside Circlip Pliers: 57001-143

- Pull out the piston assembly [K].

NOTICE

Do not remove the secondary cup from the piston since removal will damage it.

- Replace:
 - Diaphragm [D]
 - Dust Cover [H]
 - Circlip [I]
 - Piston Assembly [K]

Rear Master Cylinder Disassembly

- Remove:
 - Rear Master Cylinder (see Rear Master Cylinder Removal(12-19))
 - Brake Reservoir Cap Screws [A] and Cap [B]
 - Diaphragm [C]
 - Clamps [D] and Hose [E]
 - Circlip [F] and Fitting [G]
 - O-ring [H]

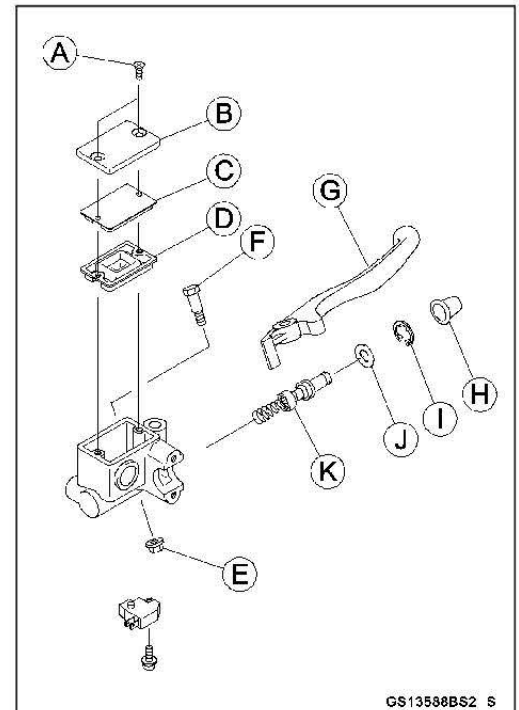
Special Tool - Inside Circlip Pliers: 57001-143

- Slide the dust cover out of place, and remove the circlip [I].
- Pull out the push rod assembly [J].
- Remove the piston assembly [K].

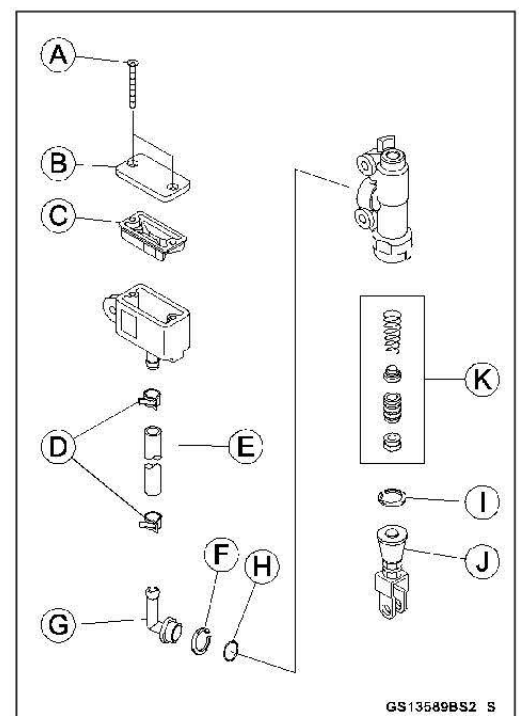
NOTICE

Do not remove the secondary cup from the piston since removal will damage it.

- Replace:
 - Diaphragm [C]
 - Hose [E]
 - Circlip [F]
 - O-ring [H]
 - Circlip [I]
 - Push Rod Assembly [J]
 - Piston Assembly [K]



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GS1358BS2 S

2-46 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

Master Cylinder Assembly

- Before assembly, clean all parts including the master cylinder with brake fluid or alcohol.

NOTICE

Except for the disc pads and disc, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol for cleaning brake parts. Do not use any other fluid for cleaning these parts. Gasoline, engine oil, or any other petroleum distillate will cause deterioration of the rubber parts. Oil spilled on any part will be difficult to wash off completely, and will eventually deteriorate the rubber used in the disc brake.

- Apply brake fluid to the new parts and to the inner wall of the cylinder.
- Take care not to scratch the piston or the inner wall of the cylinder.
- Apply silicone grease to the followings.

Front: Brake Lever Pivot Bolt
Dust Cover

Rear: Dust Cover
Upper End of Push Rod Assembly

- Tighten:

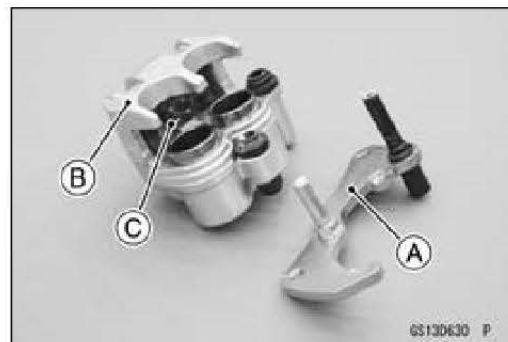
Torque - Brake Lever Pivot Bolt: 5.9 N·m (0.60 kgf·m, 52 in·lb)

Brake Lever Pivot Locknut: 5.9 N·m (0.60 kgf·m, 52 in·lb)

Caliper Rubber Parts Replacement

Front Caliper Disassembly

- Remove:
Front Caliper (see Front Caliper Removal(12-10))
Brake Pads (see Front Brake Pad Removal(12-16))
- Separate the caliper holder [A] from the caliper [B].
- Remove the pad spring [C].



Periodic Maintenance Procedures

- Using compressed air, remove the pistons.
- Cover the caliper opening with a clean heavy cloth [A].
- Remove the pistons by lightly applying compressed air [B] to the hose joint opening.



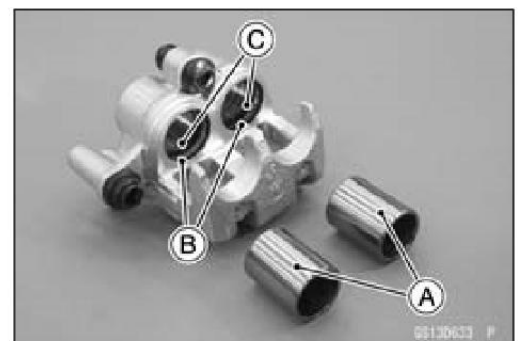
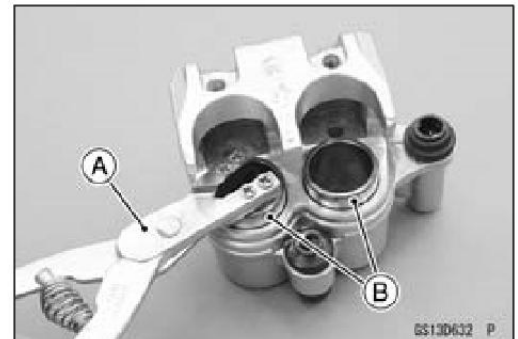
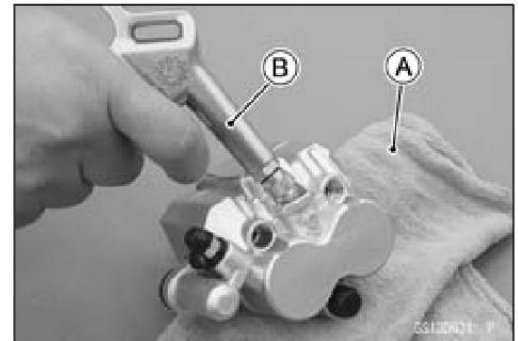
WARNING

The piston in the brake caliper can crush hands and fingers. Never place your hand or fingers in front of the piston.

- When compressed air is not used, using the brake caliper piston pliers [A], remove the pistons [B].

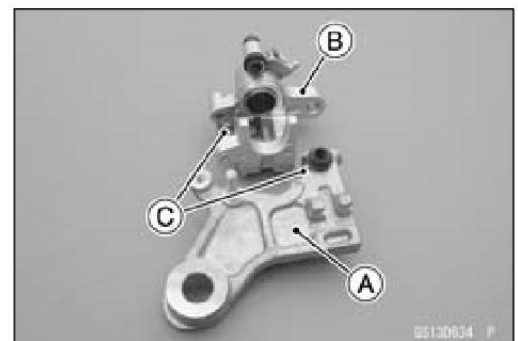
**Special Tool - Brake Caliper Piston Pliers ($\phi 16 \sim \phi 26$):
57001-1861**

- Pull out the pistons [A] by hand.
- Remove the dust seals [B] and fluid seals [C] on each cylinder.



Rear Caliper Disassembly

- Remove:
 - Rear Caliper (see Rear Caliper Removal(12-11))
 - Brake Pads (see Rear Brake Pad Removal(12-16))
- Separate the caliper holder [A] from the caliper [B].
- Remove the pad springs [C].



2-48 PERIODIC MAINTENANCE

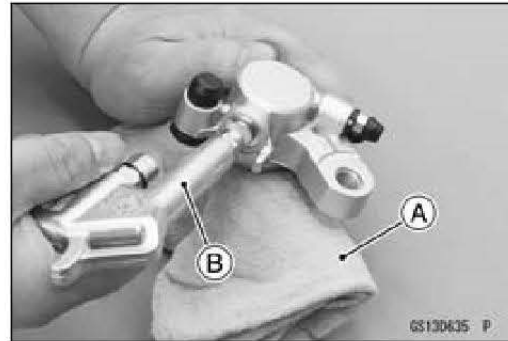
Periodic Maintenance Procedures

- Using compressed air, remove the piston.
- Cover the caliper opening with a clean heavy cloth [A].
- Remove the piston by lightly applying compressed air [B] to the hose joint opening.



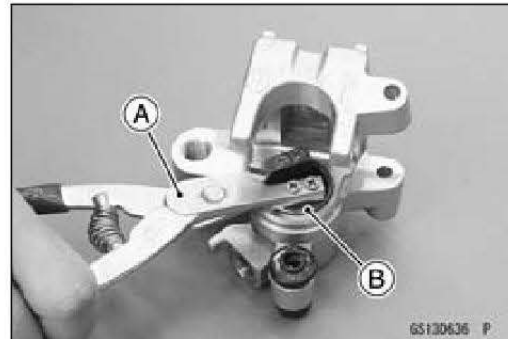
WARNING

The piston in the brake caliper can crush hands and fingers. Never place your hand or fingers in front of the piston.

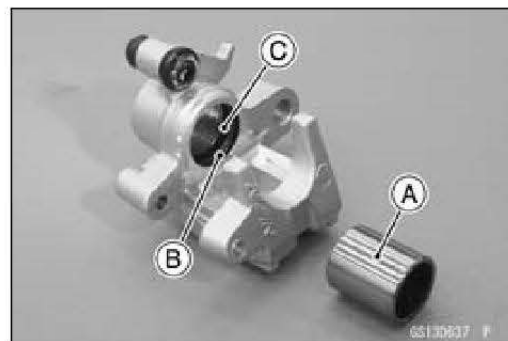


- When compressed air is not used, using the brake caliper piston pliers [A], remove the piston [B].

**Special Tool - Brake Caliper Piston Pliers ($\phi 16 \sim \phi 26$):
57001-1861**



- Pull out the piston [A] by hand.
- Remove the dust seal [B] and fluid seal [C].



Caliper Assembly

- Clean the caliper parts except for the pads.

NOTICE

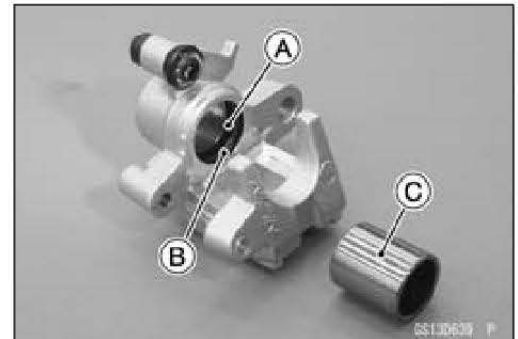
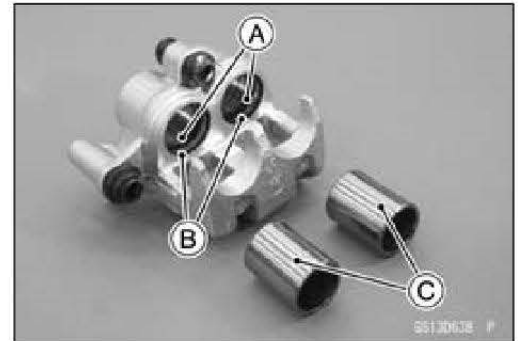
For cleaning of the parts, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol.

- ★ If you removed the bleed valve, install the bleed valve and rubber cap.

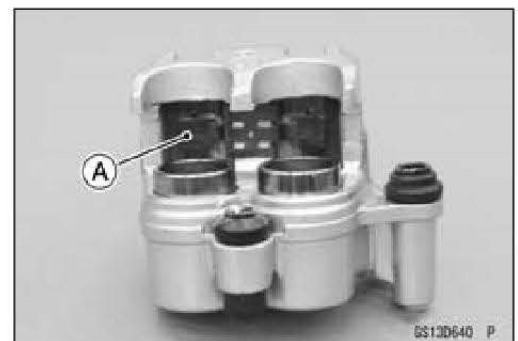
Torque - Caliper Bleed Valve: 7.8 N·m (0.80 kgf·m, 69 in·lb)

Periodic Maintenance Procedures

- Replace the fluid seal(s) [A] with new ones.
- Apply silicone grease to the fluid seal(s), and install them into the cylinder(s) by hand.
- Replace the dust seal(s) [B] with new ones.
- Apply brake fluid to the dust seal(s), and install them into the cylinder(s) by hand.
- Apply brake fluid to the outside of the piston(s) [C], and push them into each cylinder by hand.



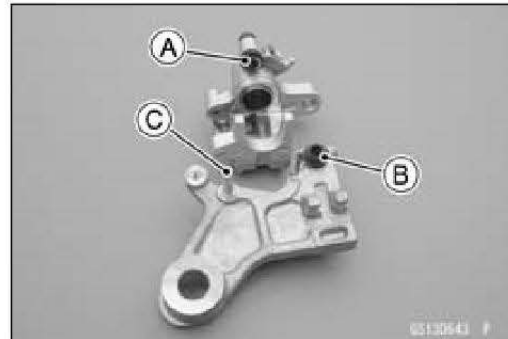
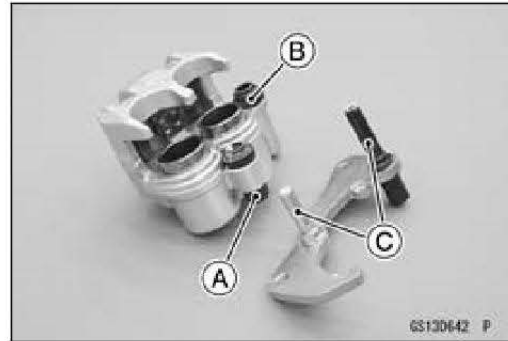
- Install the pad springs [A] as shown.



2-50 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

- Replace the friction boot [A] and dust boot [B] if they are damaged.
- Apply a thin coat of silicone grease to the caliper holder shafts [C] and holder holes.
- Assemble the caliper and caliper holder.



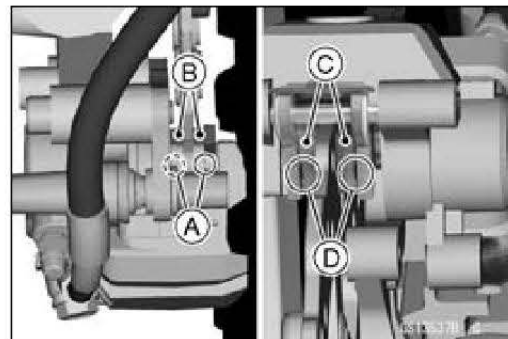
- Install the removed parts.
- Wipe up any spilled brake fluid on the caliper with wet cloth.

Brake Pad Wear Inspection

- Clean the brake calipers especially around the brake pads.
- Visually inspect the lining thickness of the brake pads in each caliper.

○ Use an inspection mirror as required.

- ★ If the wear indicators [A] of the front brake pads [B] cannot be seen (i.e. worn out), or the rear brake pads [C] has been worn until the wear indicator [D], remove the brake pads (see [Front Brake Pad Removal\(12-16\)](#)) (see [Rear Brake Pad Removal\(12-16\)](#)) and inspect them as follows.



- Check the lining thickness [A] and condition of the brake pads in each caliper.
- ★ If the lining thickness of either pad is less than the service limit [B], replace both pads in the caliper as a set.

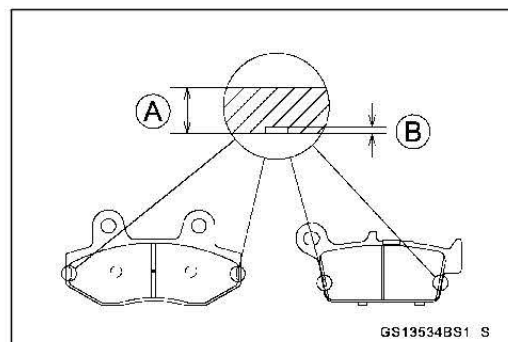
Brake Pad Lining Thickness

Standard:

Front	4.5 mm (0.18 in.)
Rear	6.4 mm (0.25 in.)

Service Limit:

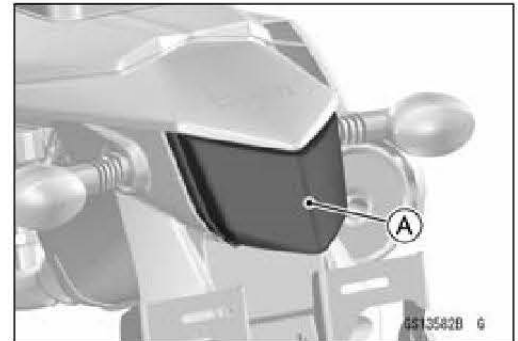
Front	1 mm (0.04 in.)
Rear	1 mm (0.04 in.)



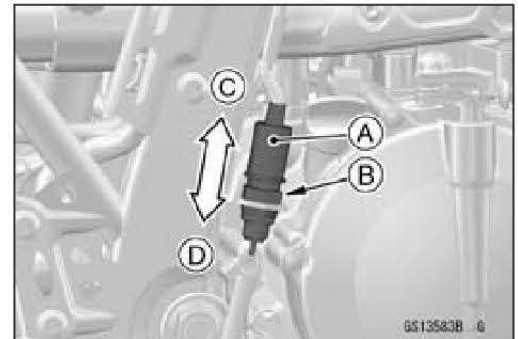
Periodic Maintenance Procedures

Brake Light Switch Operation Inspection

- Turn the ignition switch on.
- The brake light [A] should go on when the brake lever is applied or after the brake pedal is depressed about 10 mm (0.39 in.).



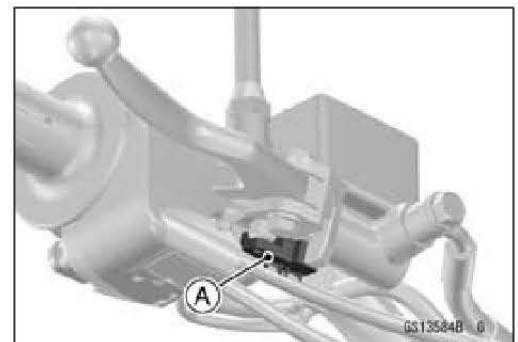
- ★ If it does not, adjust the brake light switch.
- While holding the switch body [A], turn the adjusting nut [B] to adjust the switch.
 Light sooner as the body rises [C]
 Light later as the body lowers [D]



NOTICE

To avoid damaging the electrical connections inside the switch, be sure that the switch body does not turn during adjustment.

- ★ If it does not go on, inspect or replace the following parts.
 Battery (see [Charging Condition Inspection\(16-21\)](#))
 Brake Light (see [Brake/Tail Light Bulb Replacement\(16-55\)](#))
 Main Fuse 20 A and Lamp Fuse 10 A (see [Fuse Inspection\(16-81\)](#))
 Front Brake Light Switch [A] (see [Switch Inspection\(16-79\)](#))
 Rear Brake Light Switch (see [Switch Inspection\(16-79\)](#))
 Harness (see [Wiring Inspection\(16-19\)](#))

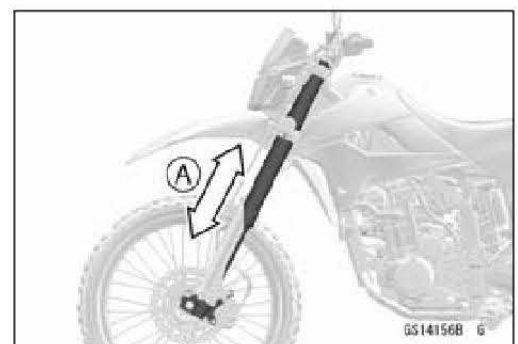


Suspension

Suspension System Inspection

Front Forks/Rear Shock Absorber Operation Inspection

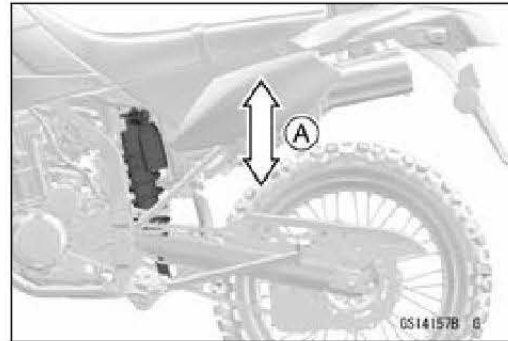
- Pump the forks down and up [A] 4 or 5 times, and inspect the smooth stroke.
- ★ If the forks do not smoothly or noise is found, inspect the fork oil level or fork clamps (see [Front Fork Oil Change\(13-11\)](#)).



2-52 PERIODIC MAINTENANCE

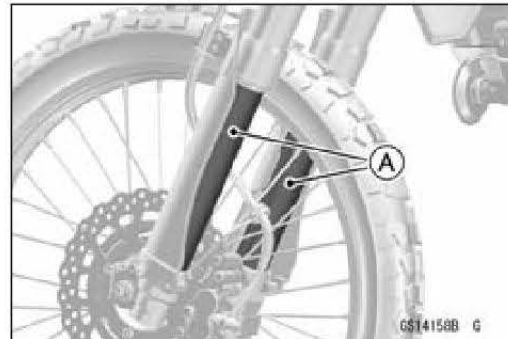
Periodic Maintenance Procedures

- Pump the seat down and up [A] 4 or 5 times, and inspect the smooth stroke.
- ★ If the shock absorber does not smoothly stroke or noise is found, inspect the oil leak.



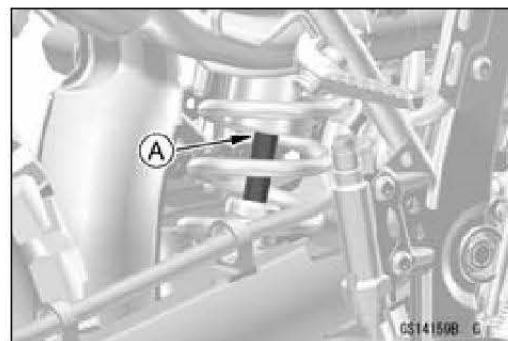
Front Fork Oil Leak Inspection

- Visually inspect the front forks [A] for oil leakage.
- ★ Replace any defective parts, if necessary.



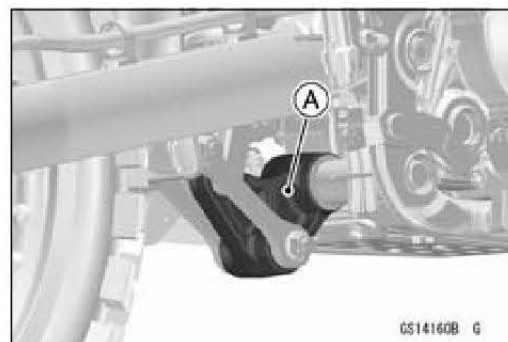
Rear Shock Absorber Oil Leak Inspection

- Visually inspect that there is no oil stain on the parts around the rear shock absorber [A].
- Since the rear shock absorber body and the piston rod are covered, it is difficult to inspect directly.
- ★ If the oil leakage is found on it, replace the rear shock absorber with a new one.



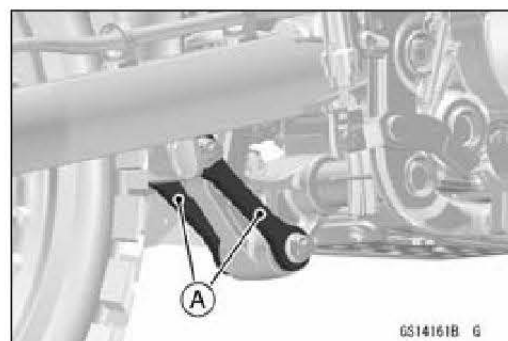
Rocker Arm Operation Inspection

- Pump the seat down and up 4 or 5 times, and inspect the smooth stroke.
- ★ If the rocker arm [A] do not smoothly stroke or noise is found, inspect the fasteners and bearings (see Needle Bearing Inspection(13-29)).



Tie-Rod Operation Inspection

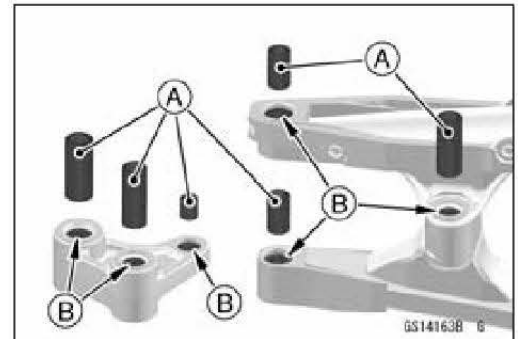
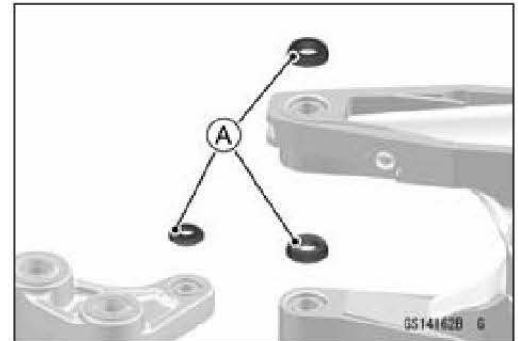
- Pump the seat down and up 4 or 5 times, and inspect the smooth stroke.
- ★ If the tie-rods [A] do not smoothly stroke or noise is found, inspect the fasteners and tie-rod bearings (see Needle Bearing Inspection(13-29)).



Periodic Maintenance Procedures

Rear Suspension Lubrication

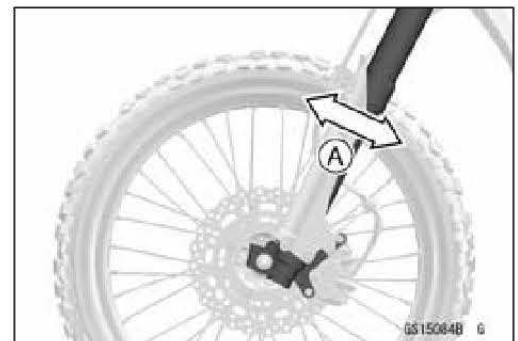
- Remove:
 - Rocker Arm (see [Rocker Arm Removal\(13-25\)](#))
 - Swingarm (see [Swingarm Removal\(13-22\)](#))
 - Grease Seals [A]
- Remove the sleeves [A].
- Using a high flash-point solvent, clean the old grease out of the needle bearings [B].
- Apply grease to the followings.
 - Needle Bearings
 - Grease Seal Lips
- Install the removed parts.



Steering

Steering Play Inspection

- Raise the front wheel off the ground with the front stand or the webbing sling.
- With the front wheel pointing straight ahead, alternately push each end of the handlebar. Confirm the front wheel should swing lightly left and right until the fork hits the stop.
- ★ If the wheel binds or catches before the stop, the steering is too tight.
- Feel for steering looseness by pushing and pulling [A] the forks.
- ★ If you feel looseness, the steering is too loose.

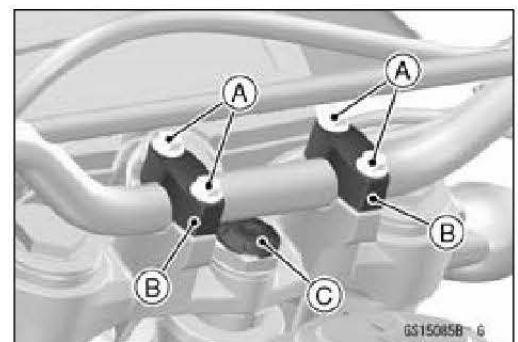


NOTE

- The wirings will have some effect on the motion of the fork which must be taken into account.
- Be sure the leads are properly routed.
- The bearings must be in good condition and properly lubricated in order for any test to be valid.

Steering Play Adjustment

- Remove:
 - Rear View Mirror (see [Rear View Mirror Removal\(15-21\)](#))
 - Handlebar Clamp Bolts [A]
 - Handlebar Clamps [B]
 - Cap [C]



2-54 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

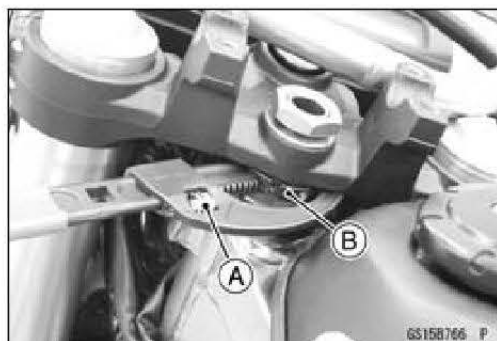
- Loosen:
 - Upper Front Fork Clamp Bolts [A] (Both Sides)
 - Steering Stem Head Nut [B]
- Raise the front wheel off the ground.



- Adjust the steering using the special tool [A].
 - Special Tool - Steering Stem Nut Wrench: 57001-1100 or Adjustable Hook Wrench: 57001-1863**
- ★ If the steering is too tight, loosen the stem nut [B] a fraction of a turn.
- ★ If the steering is too loose, tighten the stem nut a fraction of a turn.

NOTE

○ Turn the stem nut 1/8 turn at time maximum.



- Tighten:
 - Torque - Steering Stem Head Nut: 44 N·m (4.5 kgf·m, 32 ft·lb)**
 - Upper Front Fork Clamp Bolts: 20 N·m (2.0 kgf·m, 15 ft·lb)**

NOTE

- Tighten the steering stem head nut first, next the upper front fork clamp bolts.
- Tighten the two clamp bolts alternately two times to ensure even tightening torque.

- Check the steering again.
- ★ If the steering is still too tight or too loose, repeat the adjustment.
- Install the removed parts.

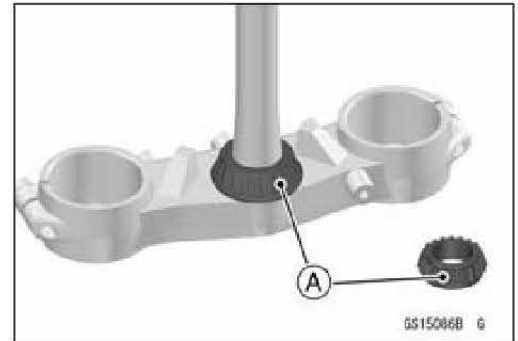
WARNING

If the handlebars do not turn to the steering stop, they may cause an accident resulting in injury or death. Be sure the cables, harnesses and hoses are routed properly and do not interfere with handlebar movement (see Cable, Wire, and Hose Routing section (17-2)).

Periodic Maintenance Procedures

Steering Stem Bearing Lubrication

- Remove the steering stem (see [Steering Stem, Stem Bearing Removal\(14-6\)](#)).
- Using a high flash-point solvent, wash the upper and lower tapered rollers [A] in the cages, and wipe the upper and lower outer races, which are press-fitted into the frame head pipe, clean off grease and dirt.
- Visually check the outer races and rollers.
- ★ Replace the bearing assemblies if they show wear or damage.
- Pack the upper and lower tapered roller bearings in the cages with grease, and apply a light coat of grease to the upper and lower outer races.
- Install the steering stem (see [Steering Stem, Stem Bearing Installation\(14-8\)](#)).
- Adjust the steering (see [Steering Play Adjustment\(2-53\)](#)).



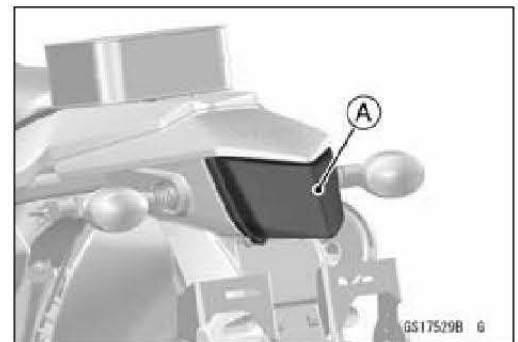
Electrical System

Lights and Switches Operation Inspection

First Step

- Set the gear position in the neutral position.
- Turn the ignition switch on.
- The following lights should go on.

Taillight [A]
Meter Panel LCD [B]
Green Neutral Indicator Light (LED) [C]
Headlight [D]



NOTE

○All indicator lights (LED) appear for a few seconds when the ignition switch is turned on.

- ★ If the light does not go on, inspect or replace the following parts.

Battery (see [Charging Condition Inspection\(16-21\)](#))

Meter Panel LCD (see [Meter Unit Inspection\(16-66\)](#))

Indicator Lights (LED) (see [Meter Unit Inspection\(16-66\)](#))

ECU (see [ECU Power Supply Inspection\(3-93\)](#))

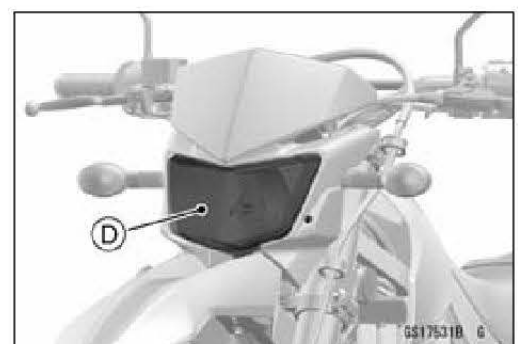
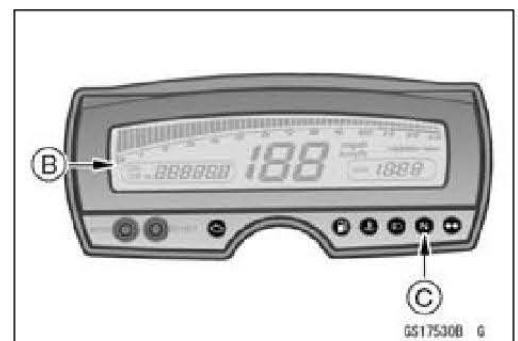
Main Fuse 20 A and Lighting System Fuse 10 A (see [Fuse Inspection\(16-81\)](#))

Ignition Switch and Neutral Switch (see [Switch Inspection\(16-79\)](#))

Brake/Tail Light Bulb (see [Brake/Tail Light Bulb Replacement\(16-55\)](#))

Headlight Bulb (see [Headlight Bulb Replacement\(16-53\)](#))

Harness (see [Wiring Inspection\(16-19\)](#))



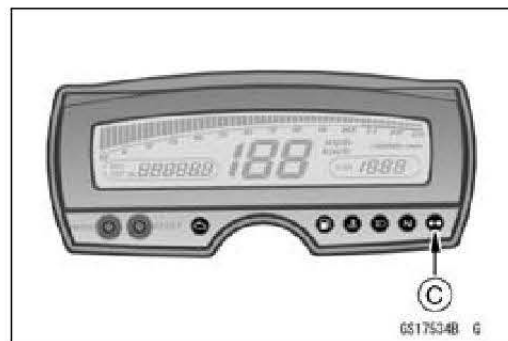
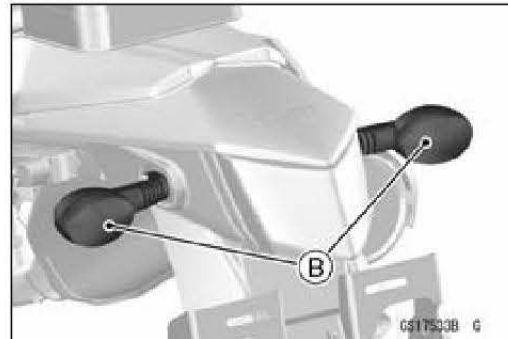
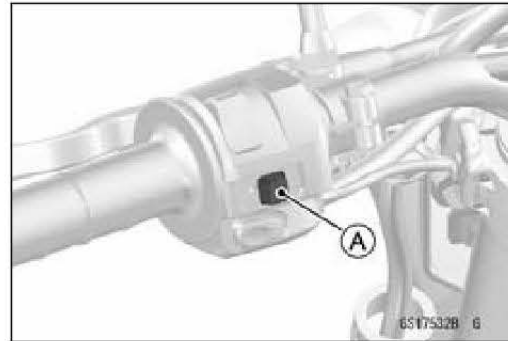
- Turn the ignition switch off.
- The all lights should go off.
- ★ If the light does not go off, replace the ignition switch.

2-56 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

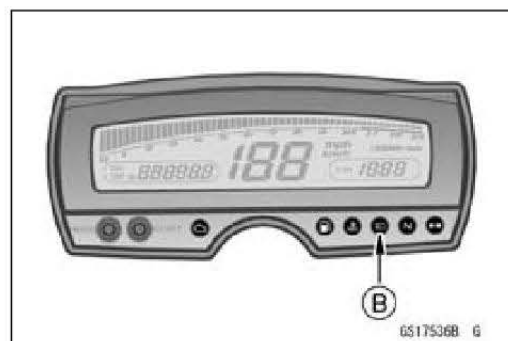
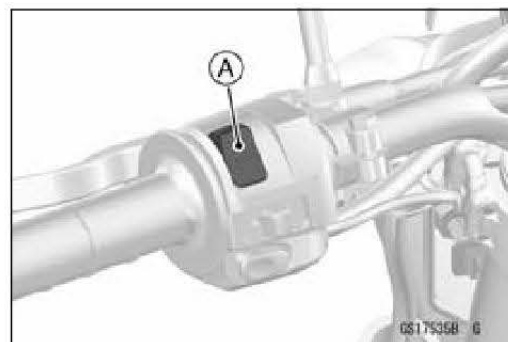
Second Step

- Turn the ignition switch on.
- Turn on the turn signal switch [A] (left or right position).
- The left or right turn signal lights [B] (front and rear) according to the switch position should blink.
- The green turn signal indicator light (LED) [C] in the meter unit should blink.
- ★ If the each light does not blink, inspect or replace the following parts.
 - Turn Signal Light Bulb (see [Turn Signal Light Bulb Replacement\(16-57\)](#))
 - Green Turn Signal Indicator Light (LED) (see [Meter Unit Inspection\(16-66\)](#))
 - Turn Signal Switch (see [Switch Inspection\(16-79\)](#))
 - Turn Signal Relay (see [Turn Signal Relay Inspection\(16-58\)](#))
 - Harness (see [Wiring Inspection\(16-19\)](#))
- Push the turn signal switch.
- The turn signal lights and green turn signal indicator light (LED) should go off.
- ★ If the light does not go off, inspect or replace the following parts.
 - Turn Signal Switch (see [Switch Inspection\(16-79\)](#))
 - Turn Signal Relay (see [Turn Signal Relay Inspection\(16-58\)](#))



Third Step

- Set the dimmer switch [A] to the high beam position.
- The headlight should switch to the high beam.
- The blue high beam indicator light (LED) [B] should go on.
- ★ If the high beam headlight and/or blue high beam indicator light (LED) does not go on, inspect or replace the following parts.
 - Headlight Bulb (see [Headlight Bulb Replacement\(16-53\)](#))
 - Dimmer Switch (see [Switch Inspection\(16-79\)](#))
 - Blue High Beam Indicator Light (LED) (see [Meter Unit Inspection\(16-66\)](#))
- Turn the ignition switch off.
- The headlight and blue high beam indicator light (LED) should go off.



Headlight Aiming Inspection

- Inspect the headlight beam for aiming.
- ★ If the headlight beam points to one side rather than straight ahead, adjust the horizontal beam.

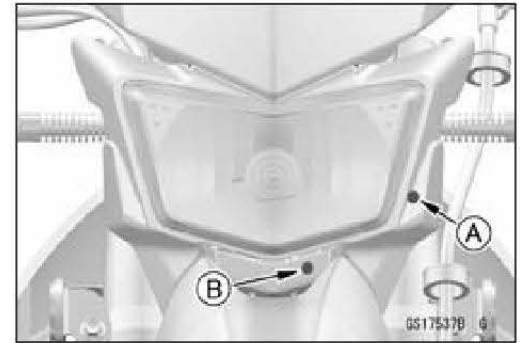
Periodic Maintenance Procedures

Headlight Beam Horizontal Adjustment

- Turn the horizontal adjuster [A] in both headlights in or out until the beam points straight ahead.
- ★ If the headlight beam points too low or high, adjust the vertical beam.

Headlight Beam Vertical Adjustment

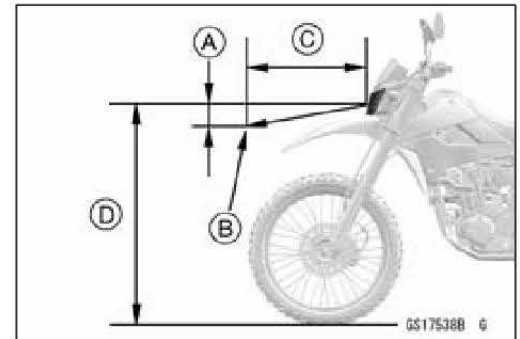
- Turn the vertical adjuster [B] in both headlights in or out to adjust the headlight vertically.



NOTE

- On high beam, the brightest points should be slightly below horizontal with the motorcycle on its wheels and the rider seated. Adjust the headlight to the proper angle according to local regulations.
- For the US model, the proper angle is 0.4 degrees below horizontal. This is 50 mm (2.0 in.) drop at 7.6 m (25 ft) measured from the center of the headlight with the motorcycle on its wheels and the rider seated.

50 mm (2.0 in.) [A]
 Center of Brightest Spot [B]
 7.6 m (25 ft) [C]
 Height of Headlight Center [D]

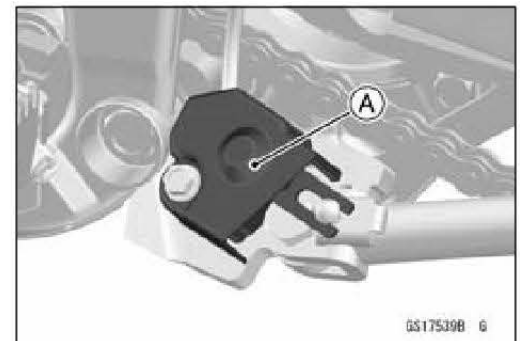


Side Stand Switch Operation Inspection

- Raise the rear wheel off the ground with the suitable stand or the jack (see Rear Wheel Removal(10-9)).
- Inspect the side stand switch [A] operation accordance to below table.

Side Stand Switch Operation

Side Stand	Gear Position	Clutch Lever	Engine Start	Engine Run
Up	Neutral	Released	Starts	Continue running
Up	Neutral	Pulled in	Starts	Continue running
Up	In Gear	Released	Does not start	Continue running
Up	In Gear	Pulled in	Starts	Continue running
Down	Neutral	Released	Starts	Continue running
Down	Neutral	Pulled in	Starts	Continue running
Down	In Gear	Released	Does not start	Stops
Down	In Gear	Pulled in	Does not start	Stops



2-58 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

★ If the side stand switch operation does not work, inspect or replace the following parts.

Battery (see [Charging Condition Inspection\(16-21\)](#))

Main Fuse 20 A (see [Fuse Inspection\(16-81\)](#))

Ignition Switch (see [Switch Inspection\(16-79\)](#))

Side Stand Switch (see [Switch Inspection\(16-79\)](#))

Ignition Fuse 10 A and ECU Fuse 15 A (see [Fuse Inspection\(16-81\)](#))

Engine Stop Switch and Starter Button (see [Switch Inspection\(16-79\)](#))

Interlock Diode Unit (see [Interlock Diode Unit Inspection\(16-42\)](#))

Starter Lockout Switch (see [Switch Inspection\(16-79\)](#))

Starter Relay (see [Starter Relay Inspection\(16-49\)](#))

Starter Circuit Relay (see [Starter Circuit Relay Inspection\(16-50\)](#))

Neutral Switch (see [Switch Inspection\(16-79\)](#))

Harness (see [Wiring Inspection\(16-19\)](#))

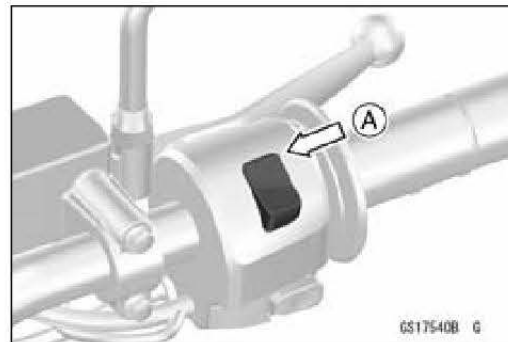
★ If the all parts are good condition, replace the ECU.

Engine Stop Switch Operation Inspection

First Step

- Turn the ignition switch on.
- Set the gear position in the neutral position.
- Turn the engine stop switch to stop position [A].
- Push the starter button.
- The engine does not start.

★ If the engine starts, inspect or replace the engine stop switch (see [Switch Inspection\(16-79\)](#)).

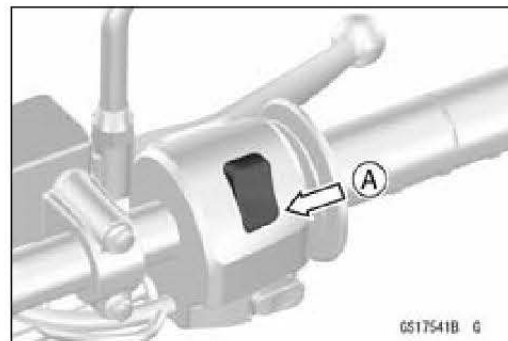


Second Step

- Turn the ignition switch on.
- Set the gear position in the neutral position.
- Turn the engine stop switch to run position [A].
- Push the starter button and start the engine.
- Turn the engine stop switch to stop position.
- Immediately the engine should be stop.

★ If the engine does not stop, inspect or replace the engine stop switch (see [Switch Inspection\(16-79\)](#)).

★ If the engine stop switch is good condition, replace the ECU.

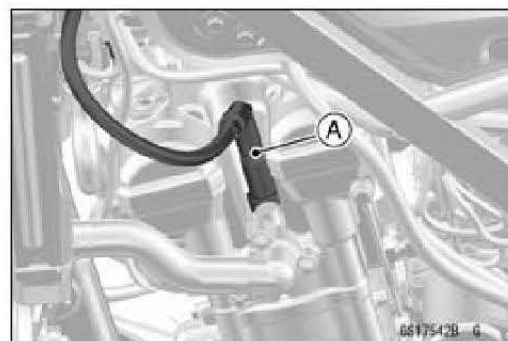


Spark Plug Replacement

- Remove the left shroud (see [Shroud Removal\(15-10\)](#)).
- Pull the spark plug cap [A] off the spark plug.

NOTICE

When removing the spark plug cap, do not pull the lead. The lead could be broken off or damaged the wires inside.



Periodic Maintenance Procedures

- Remove the spark plug [A] using the plug wrench vertically.

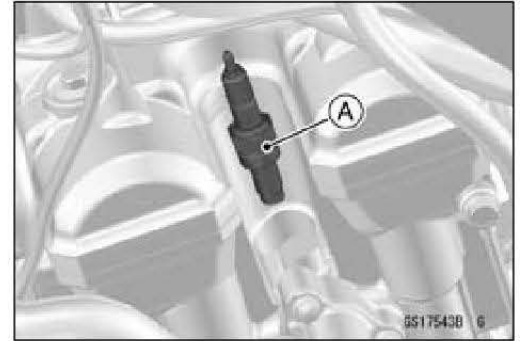
Special Tool - Spark Plug Wrench, Hex 16: 57001-1262

- Replace the spark plug with a new one.

Standard Spark Plug

Type: NGK CR8E

- Insert the spark plug vertically into the plug hole with the spark plug installed in the plug wrench, and finger-tighten it first.



NOTICE

The insulator of the spark plug may break if when the wrench is inclined during tightening.

- Tighten:
 - Torque - Spark Plug: 13 N·m (1.3 kgf·m, 115 in·lb)**
- Install the spark plug cap securely.
- After installation, be sure the spark plug cap is installed securely by pulling up it lightly.

Others

Chassis Parts Lubrication

- Before lubricating each part, clean off any rusty spots with rust remover and wipe off any grease, oil, dirt, or grime.
- Lubricate the points listed below with indicated lubricant.

NOTE

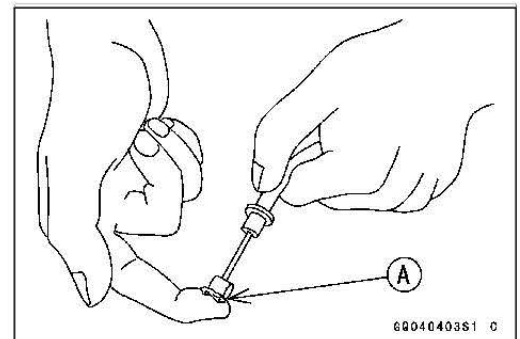
○Whenever the vehicle has been operated under wet or rainy conditions, or especially after using a high-pressure water spray, perform the general lubrication.

Pivots: Lubricate with Grease.

Brake Lever
Brake Pedal
Clutch Lever
Side Stand

Points: Lubricate with Grease.

Clutch Inner Cable Upper and Lower Ends [A]
Throttle Inner Cable Upper and Lower Ends



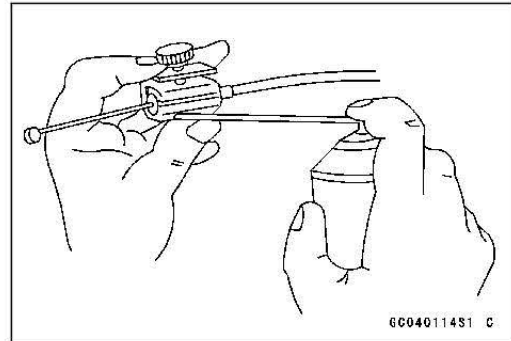
2-60 PERIODIC MAINTENANCE

Periodic Maintenance Procedures

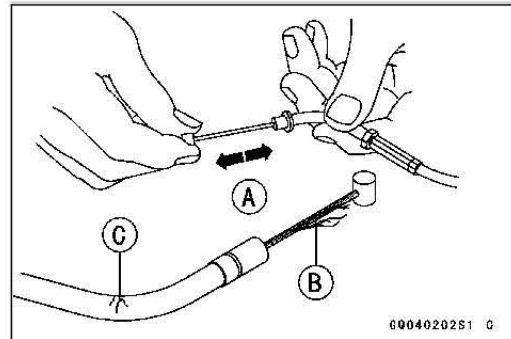
Cables: Lubricate with Rust Inhibitor.

Clutch Cable
Throttle Cables

- Lubricate the cables by seeping the oil between the cable and housing.
- The cable may be lubricated by using a commercially available pressure cable lubricator with an aerosol cable lubricant.



- With the cable disconnected at both ends, the inner cable should move freely [A] within the cable housing.
- ★ If cable movement is not free after lubricating, if the cable is frayed [B], or if the cable housing is kinked [C], replace the cable.



Condition of Bolts, Nuts and Fasteners Tightness Inspection

- Check the tightness of the bolts and nuts listed here. Also, check to see that each cotter pin is in place and in good condition.

NOTE

○ For the engine fasteners, check the tightness of them when the engine is cold (at room temperature).

- ★ If there are loose fasteners, retighten them to the specified torque following the specified tightening sequence. Refer to the appropriate chapter for torque specifications. If torque specifications are not in the appropriate chapter, see the Standard Torque Table. For each fastener, first loosen it by 1/2 turn, then tighten it.
- ★ If cotter pins are damaged, replace them with new ones.

Periodic Maintenance Procedures

Bolt, Nut and Fastener to be checked

Engine:

- Clutch Lever Pivot Bolt Locknut
- Engine Bracket Nuts
- Engine Mounting Bolts and Nuts
- Exhaust Pipe Holder Nuts
- Muffler Body Bolts and Nuts
- Muffler Body Clamp Bolt
- Radiator Bolts

Wheels:

- Front Axle Clamp Bolts
- Front Axle Nut
- Rear Axle Nut
- Rear Axle Nut Cotter Pin

Brakes:

- Brake Lever Pivot Bolt and Locknut
- Brake Pedal Bolt
- Caliper Mounting Bolts
- Brake Pad Pins
- Front Master Cylinder Clamp Bolts
- Rear Master Cylinder Mounting Bolts
- Rear Master Cylinder Push Rod Joint Cotter Pin

Suspension:

- Front Fork Clamp Bolts
- Rear Shock Absorber Bolts
- Swingarm Pivot Shaft Nut
- Tie-Rod Nuts
- Rocker Arm Nuts

Steering:

- Handlebar Clamp Bolts
- Steering Stem Head Nut

Others:

- Footpeg Bracket Bolts
- Front Fender Bolts
- Side Stand Bolt and Nut

Fuel System (DFI)

Table of Contents

Exploded View.....	3-5
DFI System.....	3-12
DFI System	3-12
DFI System Wiring Diagram	3-14
Terminal Numbers of ECU Connector.....	3-16
DFI Parts Location.....	3-18
Specifications	3-21
Special Tools and Sealant	3-23
DFI Servicing Precautions	3-25
DFI Servicing Precautions	3-25
Troubleshooting the DFI System	3-27
Outline	3-27
Inquiries to Rider.....	3-30
DFI System Troubleshooting Guide	3-33
Self-Diagnosis	3-38
Self-diagnosis Outline	3-38
Self-diagnosis Procedures	3-38
Service Code Reading	3-40
Service Code Erasing	3-40
Service Code Table.....	3-40
Backups	3-41
Main Throttle Sensor (Service Code 11)	3-44
Main Throttle Sensor Removal/Adjustment	3-44
Main Throttle Sensor Input Voltage Inspection	3-44
Main Throttle Sensor Output Voltage Inspection	3-45
Main Throttle Sensor Resistance Inspection	3-47
Main Throttle Sensor Circuit	3-47
Intake Air Pressure Sensor (Service Code 12).....	3-48
Intake Air Pressure Sensor Removal.....	3-48
Intake Air Pressure Sensor Installation.....	3-48
Intake Air Pressure Sensor Input Voltage Inspection.....	3-49
Intake Air Pressure Sensor Output Voltage Inspection.....	3-50
Intake Air Pressure Sensor Circuit.....	3-51
Intake Air Temperature Sensor (Service Code 13).....	3-52
Intake Air Temperature Sensor Removal	3-52
Intake Air Temperature Sensor Installation	3-52
Intake Air Temperature Sensor Output Voltage Inspection	3-52
Intake Air Temperature Sensor Resistance Inspection	3-53
Intake Air Temperature Sensor Circuit.....	3-54
Water Temperature Sensor (Service Code 14)	3-55
Water Temperature Sensor Removal.....	3-55
Water Temperature Sensor Installation.....	3-55
Water Temperature Sensor Output Voltage Inspection.....	3-55
Water Temperature Sensor Resistance Inspection.....	3-56
Water Temperature Sensor Circuit.....	3-56
Crankshaft Sensor (Service Code 21).....	3-57
Crankshaft Sensor Removal	3-57
Crankshaft Sensor Installation	3-57
Crankshaft Sensor Resistance Inspection	3-57
Crankshaft Sensor Peak Voltage Inspection.....	3-57

3-2 FUEL SYSTEM (DFI)

Crankshaft Sensor Circuit	3-58
Speed Sensor (Service Code 24).....	3-59
Speed Sensor Removal	3-59
Speed Sensor Installation	3-59
Speed Sensor Input Voltage Inspection	3-59
Speed Sensor Output Voltage Inspection	3-60
Speed Sensor Circuit.....	3-61
Vehicle-down Sensor (Service Code 31).....	3-62
Vehicle-down Sensor Removal	3-62
Vehicle-down Sensor Installation	3-63
Vehicle-down Sensor Input Voltage Inspection.....	3-63
Vehicle-down Sensor Output Voltage Inspection	3-64
Vehicle-down Sensor Circuit.....	3-66
Subthrottle Sensor (Service Code 32).....	3-67
Subthrottle Sensor Removal/Adjustment	3-67
Subthrottle Sensor Input Voltage Inspection.....	3-67
Subthrottle Sensor Output Voltage Inspection	3-68
Subthrottle Sensor Resistance Inspection	3-70
Subthrottle Sensor Circuit.....	3-70
Oxygen Sensor - not activated (Service Code 33)	3-71
Oxygen Sensor Removal.....	3-71
Oxygen Sensor Installation	3-71
Oxygen Sensor Inspection.....	3-71
Oxygen Sensor Circuit.....	3-73
Fuel Injector (Service Code 41).....	3-74
Fuel Injector Removal	3-74
Fuel Injector Installation	3-74
Fuel Injector Audible Inspection.....	3-75
Fuel Injector Resistance Inspection	3-75
Fuel Injector Power Source Voltage Inspection	3-76
Fuel Injector Output Voltage Inspection	3-77
Fuel Injector Fuel Line Inspection	3-78
Fuel Injector Circuit.....	3-79
Fuel Pump Relay (Service Code 46).....	3-80
Fuel Pump Relay Inspection	3-80
Fuel Pump Relay Circuit	3-81
Ignition Coil (Service Code 51).....	3-82
Ignition Coil Removal.....	3-82
Ignition Coil Installation	3-82
Ignition Coil Primary Winding Resistance Inspection.....	3-82
Ignition Coil Input Voltage Inspection	3-82
Ignition Coil Circuit.....	3-83
Radiator Fan Relay (Service Code 56).....	3-84
Radiator Fan Relay Removal/Installation.....	3-84
Radiator Fan Relay Inspection.....	3-84
Radiator Fan Relay Circuit.....	3-84
Subthrottle Valve Actuator (Service Code 62)	3-85
Subthrottle Valve Actuator Removal	3-85
Subthrottle Valve Actuator Inspection	3-85
Subthrottle Valve Actuator Resistance Inspection	3-86
Subthrottle Valve Actuator Input Voltage Inspection	3-87
Subthrottle Valve Actuator Circuit	3-88
Air Switching Valve (Service Code 64)	3-89
Air Switching Valve Removal	3-89
Air Switching Valve Installation	3-89
Air Switching Valve Inspection	3-89
Air Switching Valve Circuit	3-89

Oxygen Sensor Heater (Service Code 67)	3-90
Oxygen Sensor Heater Removal	3-90
Oxygen Sensor Heater Resistance Inspection	3-90
Oxygen Sensor Heater Power Source Voltage Inspection	3-90
Oxygen Sensor Circuit	3-91
Warning Indicator Light (LED)	3-92
Yellow Engine Warning Indicator Light (LED) Inspection	3-92
Warning Indicator (LED) Circuit	3-92
ECU	3-93
ECU Identification	3-93
ECU Removal	3-93
ECU Installation	3-93
ECU Power Supply Inspection	3-93
ECU Power Source Circuit	3-95
DFI Power Source	3-96
ECU Fuse Removal	3-96
ECU Fuse Installation	3-96
ECU Fuse Inspection	3-96
Fuel Line	3-97
Fuel Pressure Inspection	3-97
Fuel Flow Rate Inspection	3-99
Fuel Pump	3-101
Fuel Pump Removal	3-101
Fuel Pump Installation	3-102
Fuel Pump Operation Inspection	3-102
Fuel Pump Operating Voltage Inspection	3-103
Pressure Regulator Removal	3-104
Fuel Pump Circuit	3-105
Throttle Grip and Cables	3-106
Throttle Grip Free Play Inspection	3-106
Throttle Grip Free Play Adjustment	3-106
Throttle Cable Replacement	3-106
Throttle Cable Lubrication	3-107
Throttle Cable Inspection	3-107
Throttle Body Assy	3-108
Idle Speed Inspection	3-108
Idle Speed Adjustment	3-108
Throttle Bore Cleaning	3-108
Throttle Body Assy Removal	3-108
Throttle Body Assy Installation	3-109
Throttle Body Assy Disassembly	3-110
Throttle Body Assy Assembly	3-110
Air Cleaner	3-111
Air Cleaner Element Removal/Installation	3-111
Air Cleaner Element Inspection	3-111
Air Cleaner Housing Removal	3-111
Air Cleaner Housing Installation	3-112
Fuel Tank	3-113
Fuel Tank Removal	3-113
Fuel Tank Installation	3-115
Fuel Tank Inspection	3-117
Fuel Tank Cleaning	3-117
Evaporative Emission Control System (CAL Model)	3-118
Parts Removal/Installation	3-118
Hose Inspection	3-118
Separator Inspection	3-118
Canister Inspection	3-118

3-4 FUEL SYSTEM (DFI)

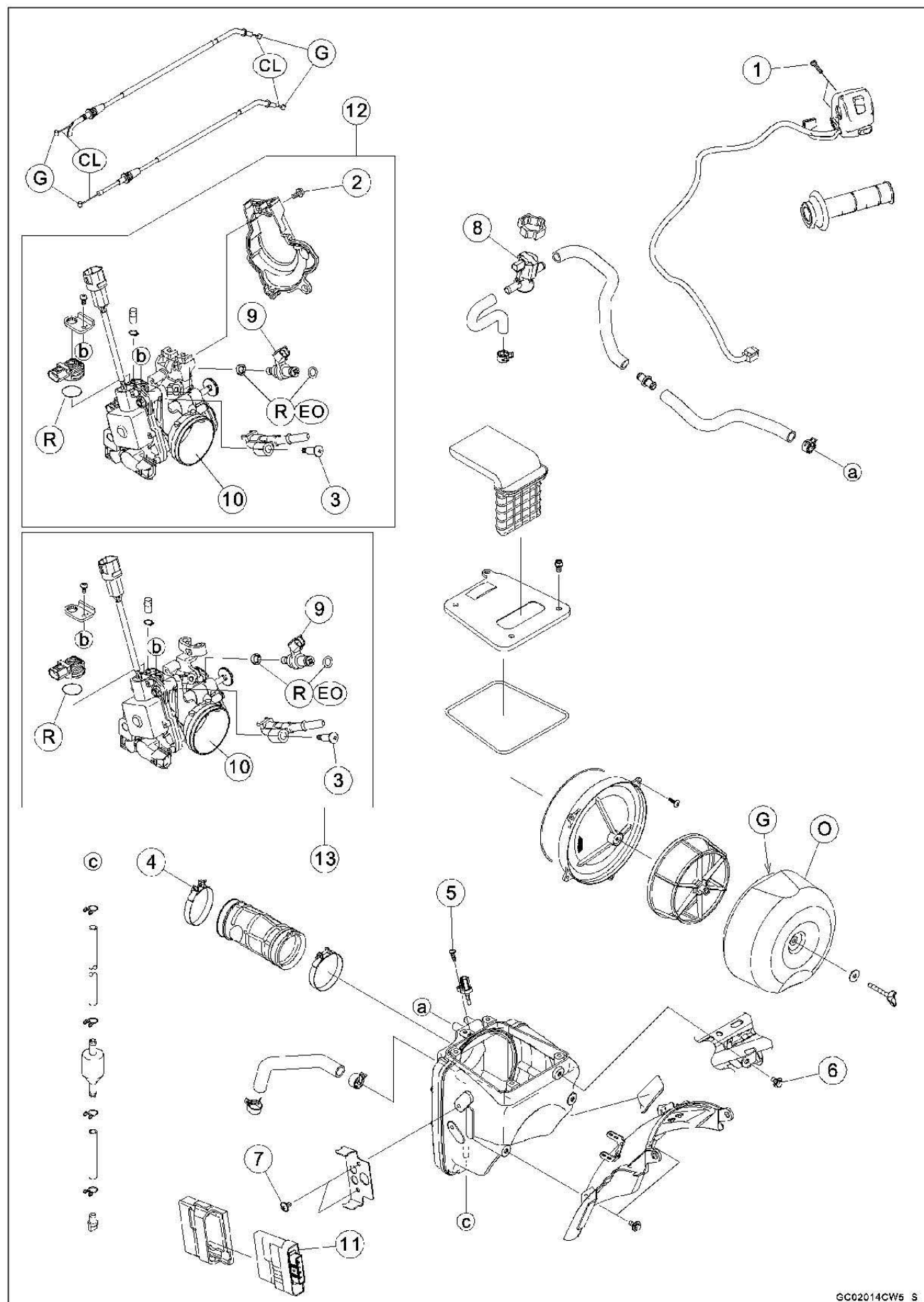
Separator Operation Test.....	3-119
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Exploded View

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3-6 FUEL SYSTEM (DFI)

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Switch Housing Screws	3.5	0.36	31 in·lb	
2	Throttle Pulley Cover Screws	6.9	0.70	61 in·lb	
3	Delivery Pipe Screw	3.4	0.35	30 in·lb	
4	Air Cleaner Housing Clamp Screw	2.0	0.20	18 in·lb	
5	Intake Air Temperature Sensor Screw	1.2	0.12	11 in·lb	
6	Air Cleaner Housing Mounting Bolt	6.9	0.70	61 in·lb	
7	ECU Bracket Screws	5.0	0.51	44 in·lb	

8. Air Switching Valve

9. Fuel Injector

10. Throttle Body Assy

11. ECU

12. KLX300D

13. KLX300E

CL: Apply cable lubricant.

EO: Apply engine oil.

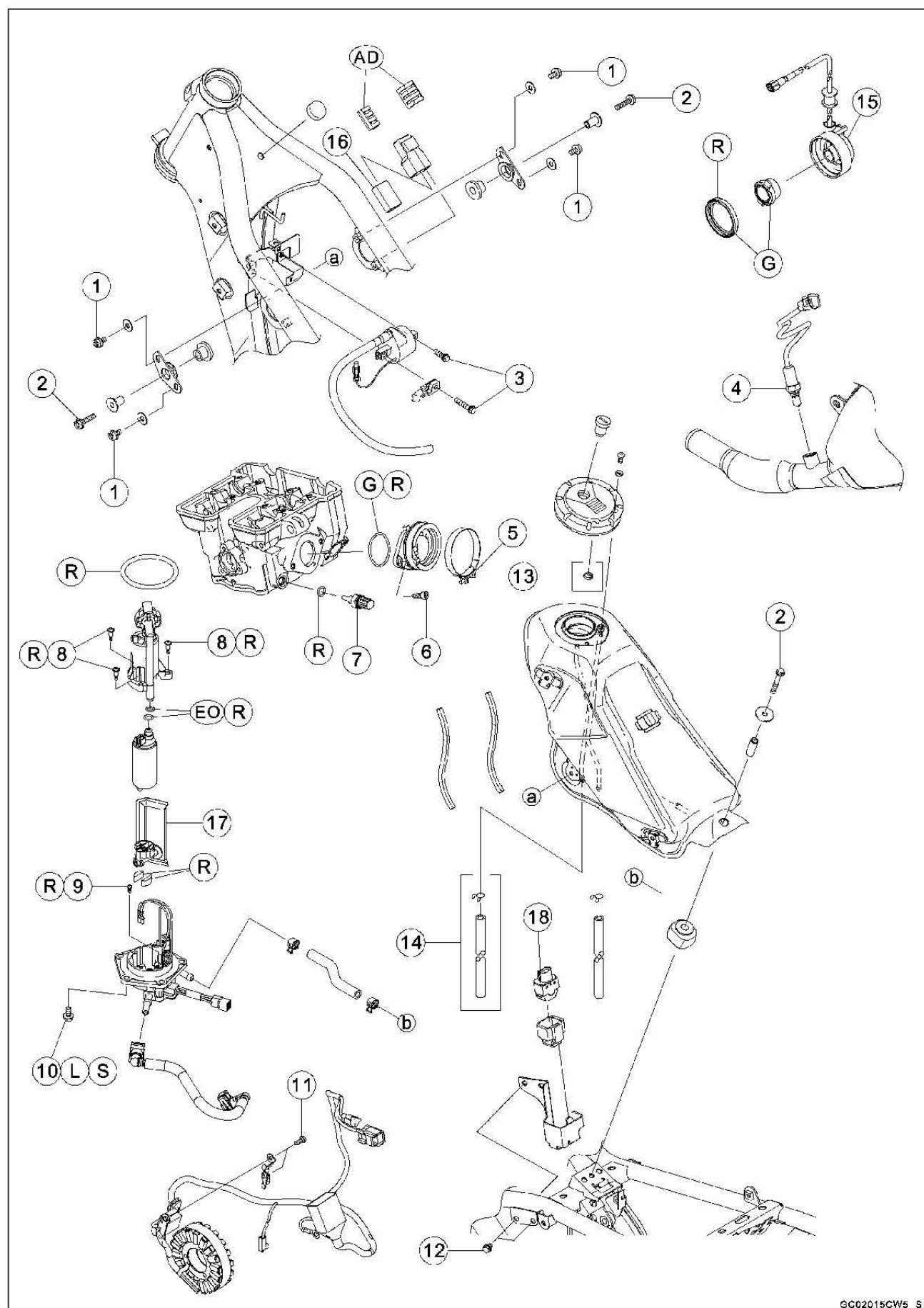
G: Apply grease.

O: Apply high-quality foam air filter oil.

R: Replacement Parts

3-8 FUEL SYSTEM (DFI)

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Fuel Tank Bracket Bolts	7.0	0.71	62 in·lb	S
2	Fuel Tank Bolts	7.0	0.71	62 in·lb	S
3	Ignition Coil Bolts	5.9	0.60	52 in·lb	
4	Oxygen Sensor	25	2.5	18	
5	Throttle Body Assy Clamp Screw	2.0	0.20	18 in·lb	
6	Throttle Body Assy Holder Bolts	12	1.2	106 in·lb	
7	Water Temperature Sensor	12	1.2	106 in·lb	
8	Fuel Pump Assembly Screws	2.06	0.210	18.2 in·lb	R
9	Lead Terminal Screw	1.18	0.120	10 in·lb	R
10	Fuel Pump Bolts	9.8	1.0	87 in·lb	L, S
11	Crankshaft Sensor Screws	2.5	0.25	22 in·lb	
12	Vehicle-down Sensor Bracket Bolts	9.8	1.0	87 in·lb	

13. CAL Model

14. CA and US Models

15. Speed Sensor

16. Fuel Pump Relay

17. Fuel Filter

18. Vehicle-down Sensor

AD: Apply adhesive.

EO: Apply engine oil.

G: Apply grease.

L: Apply a non-permanent locking agent.

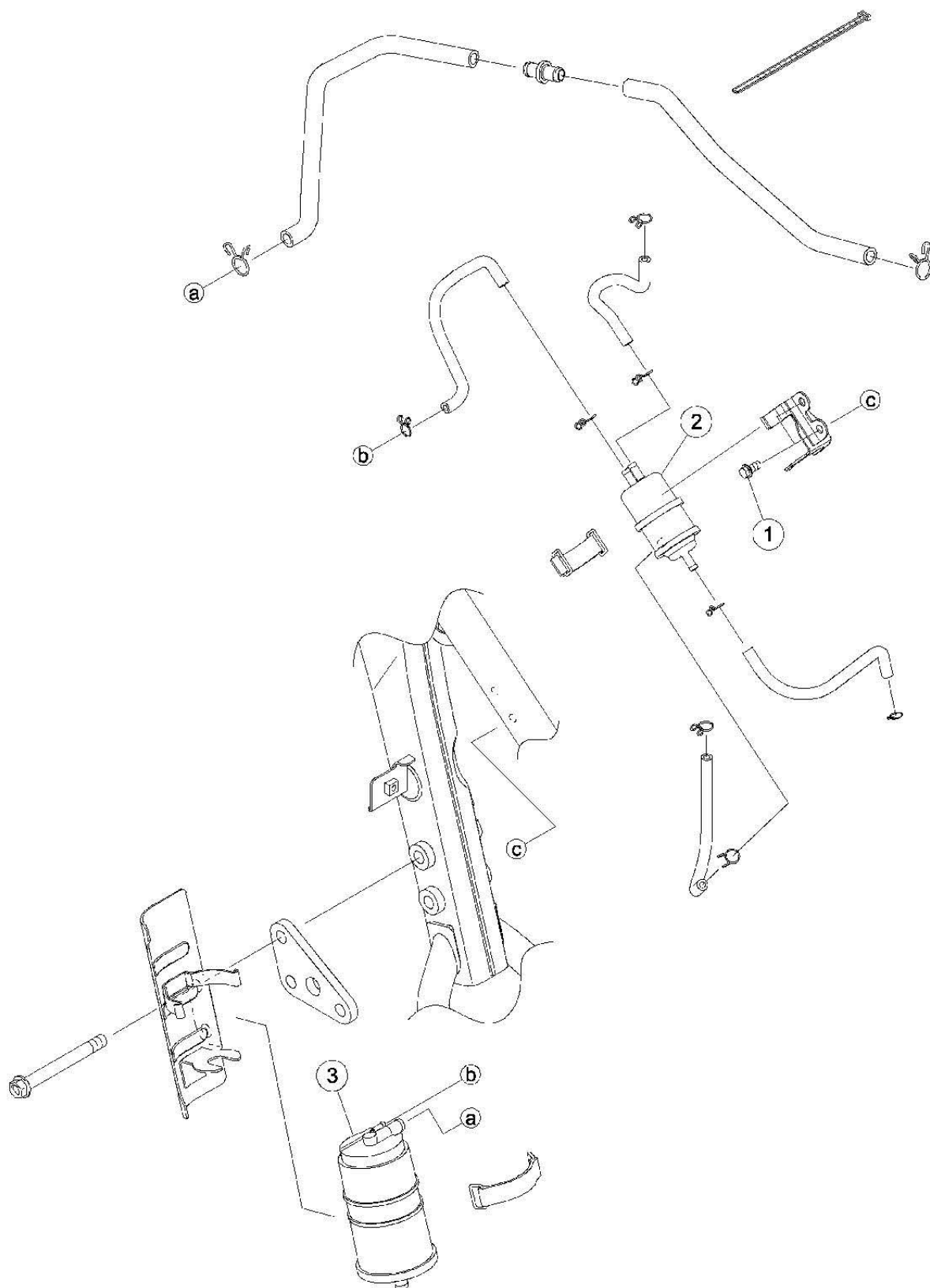
R: Replacement Parts

S: Follow the specified tightening sequence.

3-10 FUEL SYSTEM (DFI)

Exploded View

CAL Model



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Separator Bracket Bolts	9.8	1.0	87 in·lb	

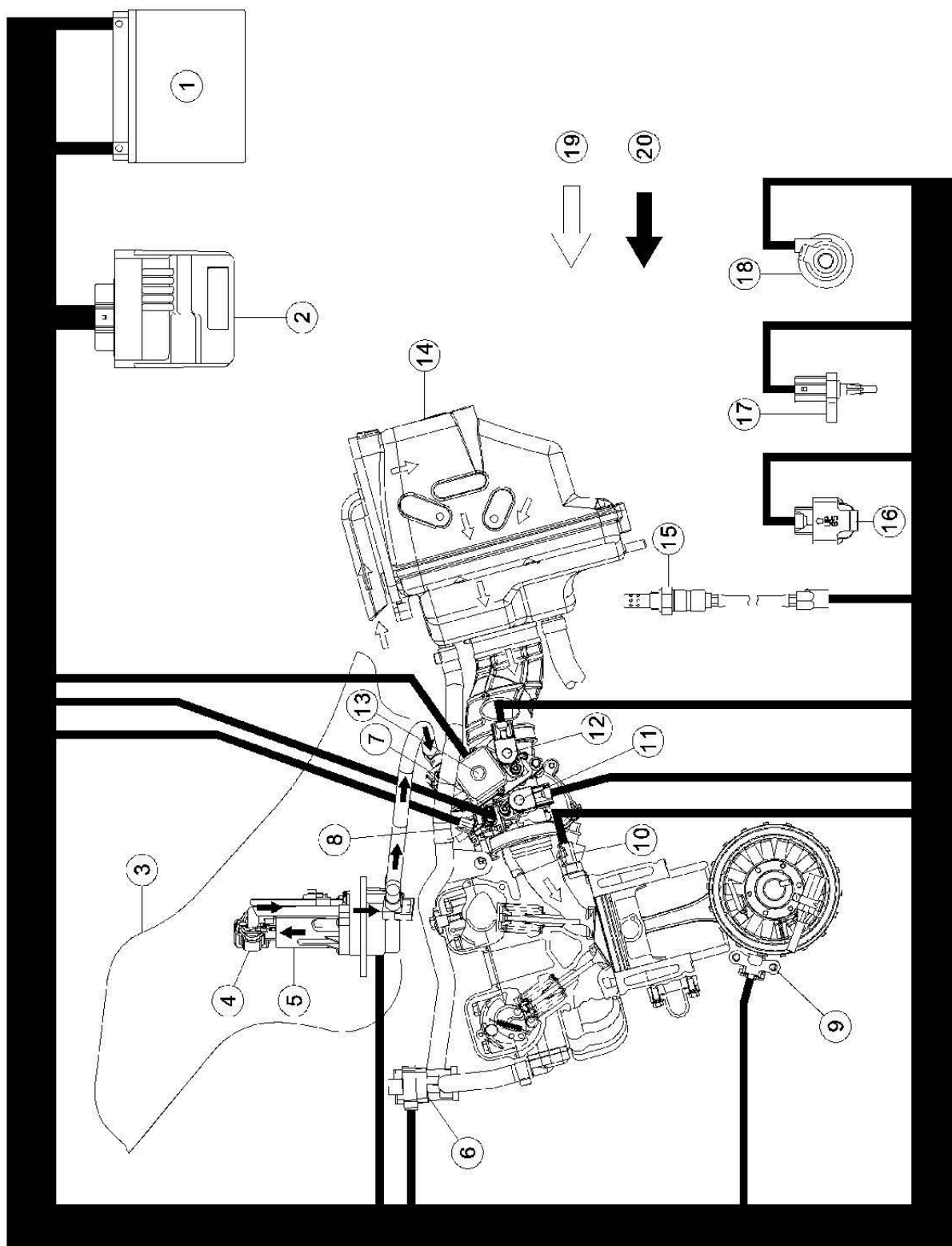
2. Separator

3. Canister

3-12 FUEL SYSTEM (DFI)

DFI System

DFI System



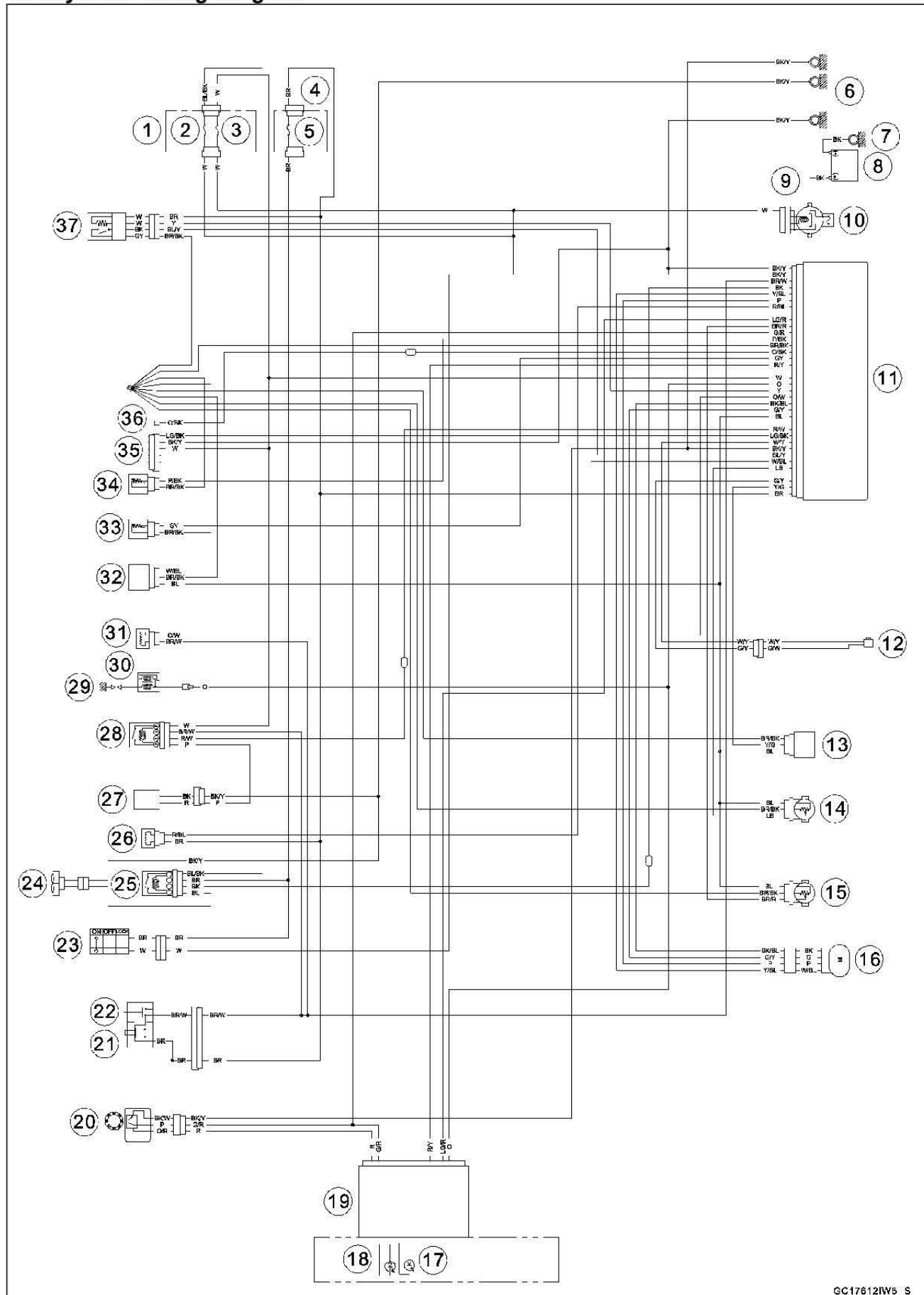
DFI System

1. Battery
2. ECU
3. Fuel Tank
4. Pressure Regulator
5. Fuel Pump
6. Air Switching Valve
7. Intake Air Pressure Sensor
8. Fuel Injector
9. Crankshaft Sensor
10. Water Temperature Sensor
11. Main Throttle Sensor
12. Subthrottle Sensor
13. Subthrottle Valve Actuator
14. Air Cleaner Housing
15. Oxygen Sensor
16. Vehicle-down Sensor
17. Intake Air Temperature Sensor
18. Speed Sensor
19. Air Flow
20. Fuel Flow

3-14 FUEL SYSTEM (DFI)

DFI System

DFI System Wiring Diagram



DFI System

Part Names

1. Fuse Box (1)
2. Radiator Fan Fuse 10 A
3. ECU Fuse 15 A
4. Fuse Box (2)
5. Ignition Fuse 10 A
6. Frame Grounds
7. Engine Ground
8. Battery
9. Starter Relay
10. Main Fuse 20 A
11. ECU
12. Crankshaft Sensor
13. Vehicle-down Sensor
14. Main Throttle Sensor
15. Subthrottle Sensor
16. Subthrottle Valve Actuator
17. Yellow Engine Warning Indicator Light (LED)
18. Red Coolant Temperature Warning Indicator Light (LED)
19. Meter Unit
20. Speed Sensor
21. Engine Stop Switch
22. Starter Button
23. Ignition Switch
24. Fan Motor
25. Fan Relay
26. Air Switching Valve
27. Fuel Pump
28. Fuel Pump Relay
29. Spark Plug
30. Ignition Coil
31. Fuel Injector
32. Intake Air Pressure Sensor
33. Water Temperature Sensor
34. Intake Air Temperature Sensor
35. Kawasaki Diagnostic System Connector
36. Self-diagnosis Terminal
37. Oxygen Sensor

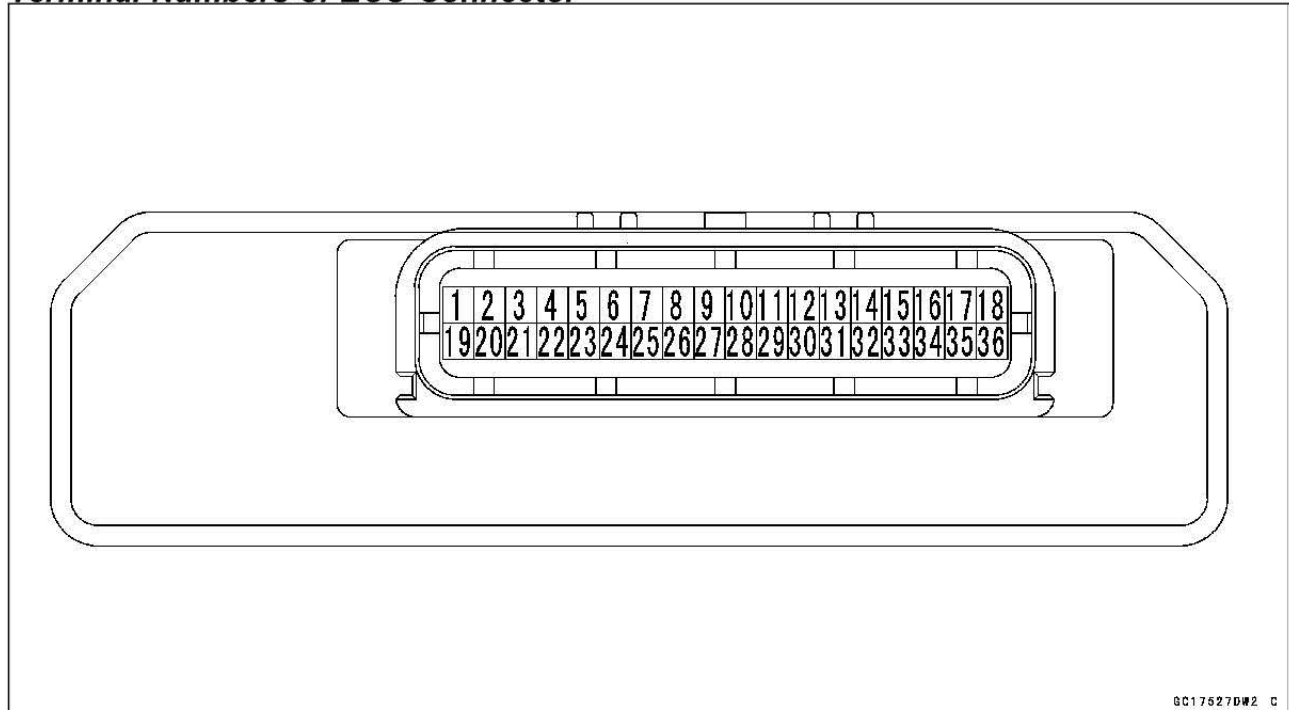
○Color Codes:

BK: Black	GY: Gray	PU: Purple
BL: Blue	LB: Light Blue	R: Red
BR: Brown	LG: Light Green	V: Violet
CH: Chocolate	O: Orange	W: White
DG: Dark Green	P: Pink	Y: Yellow
G: Green		

3-16 FUEL SYSTEM (DFI)

DFI System

Terminal Numbers of ECU Connector



Terminal Names

1. Power Supply from Ignition Switch: BR
2. Vehicle-down Sensor: Y/G
3. Crankshaft Sensor (+): G/Y
4. Unused
5. Main Throttle Sensor: LB
6. Intake Air Pressure Sensor: W/BL
7. Oxygen Sensor: BL/Y
8. Ground for Control System: BK/Y
9. Crankshaft Sensor (-): W/Y
10. External Communication Line (Kawasaki Diagnostic System): LG/BK
11. Fuel Pump Relay: R/W
12. Starter Lockout Switch: BL/R
13. Power Supply to Sensors: BL
14. Subthrottle Valve Actuator B: G/Y
15. Subthrottle Valve Actuator A: BK/BL
16. Fuel Injector: O/W
17. Oxygen Sensor Heater: Y
18. Ignition Coil: O
19. Power Supply to ECU (from Battery): W
20. Neutral Switch: LG
21. Yellow Engine Warning Indicator Light (LED): R/Y
22. Water Temperature Sensor: GY
23. Self-diagnosis Terminal: O/BK
24. Ground for Sensors: BR/BK
25. Intake Air Temperature Sensor: P/BK
26. Speed Sensor: G/R
27. Subthrottle Sensor: BR/R
28. Red Coolant Temperature Warning Indicator Light (LED): LG/R
29. Side Stand Switch: BK/R
30. Air Switching Valve: R/BL
31. Subthrottle Valve Actuator A: P
32. Subthrottle Valve Actuator B: Y/BL
33. Radiator Fan Relay: BK
34. Engine Stop Switch: BR/W

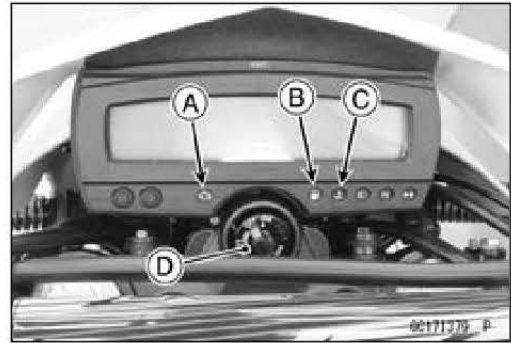
DFI System

- 35. Ground for ECU: BK/Y
- 36. Ground for ECU: BK/Y

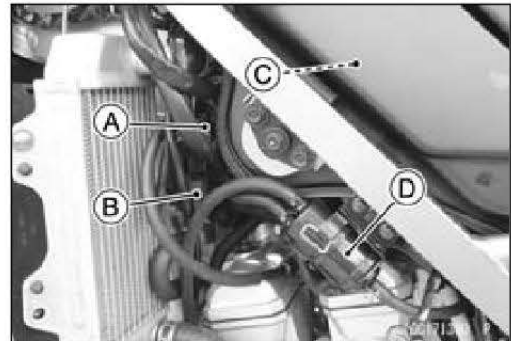
3-18 FUEL SYSTEM (DFI)

DFI Parts Location

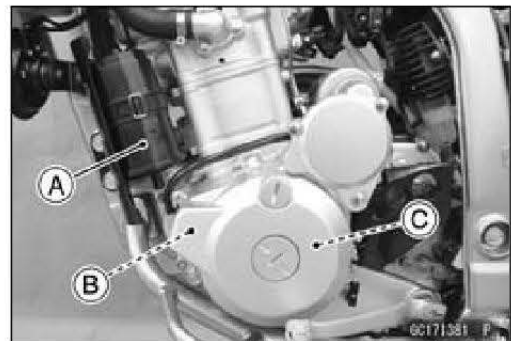
Yellow Engine Warning Indicator Light (LED) [A]
Amber Fuel Level Warning Indicator Light (LED) [B]
Red Coolant Temperature Warning Indicator light (LED) [C]
Ignition Switch [D]



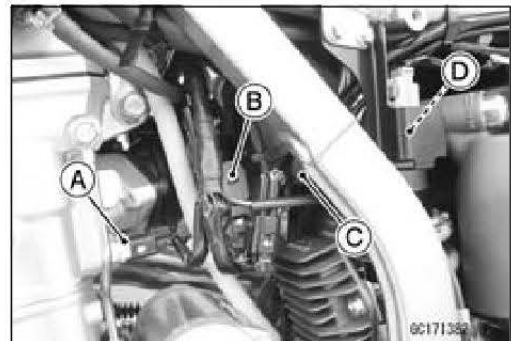
Ignition Coil [A]
Air Switching Valve [B]
Fuel Pump [C]
Separator [D] (CAL Model)



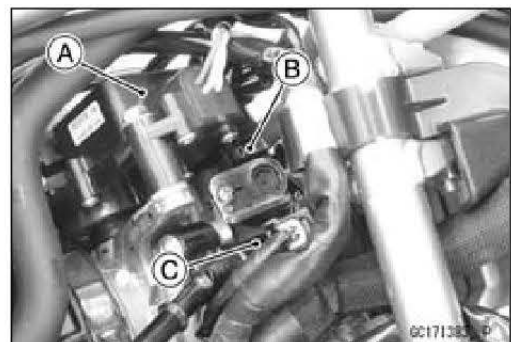
Canister [A]
Crankshaft Sensor [B]
Alternator [C]



Water Temperature Sensor [A]
Main Throttle Sensor [B]
Subthrottle Sensor [C]
Vehicle-down Sensor [D]

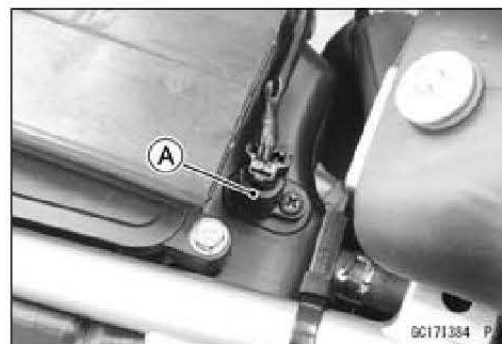


Subthrottle Valve Actuator [A]
Intake Air Pressure Sensor [B]
Fuel Injector [C]



DFI Parts Location

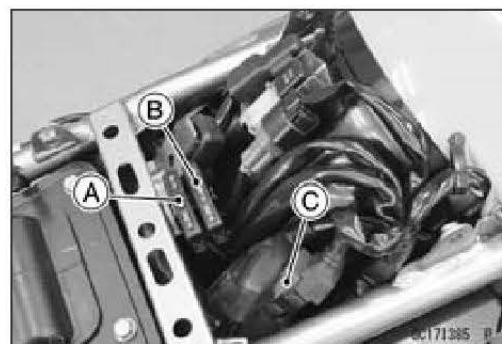
Intake Air Temperature Sensor [A]



Fuse Box (1) [A]

Fuse Box (2) [B]

Starter Relay and Main Fuse 20 A [C]

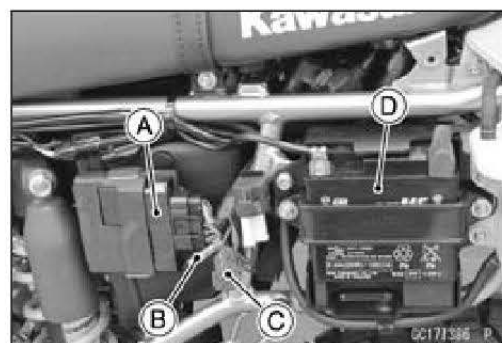


ECU [A]

Self-diagnosis Terminal [B]

Kawasaki Diagnostic System Connector [C]

Battery [D]



Oxygen Sensor [A]



Fuel Pump Relay [A]



3-20 FUEL SYSTEM (DFI)

DFI Parts Location

Speed Sensor [A]



Specifications

Item	Standard
Digital Fuel Injection System	
Idle Speed	1 500 ±50 r/min (rpm)
Throttle body Assy:	
Throttle Valve	Dual throttle valve
Bore	φ34 mm (1.3 in.)
ECU:	
Make	KEIHIN
Type	Digital memory type, with built in IC igniter, sealed with resin
Fuel Pressure (High Pressure Line)	294 kPa (3.0 kgf/cm ² , 43 psi) with engine idling
Fuel Pump:	
Type	In-tank pump
Discharge	11 mL (0.4 US oz.) or more for 2 seconds
Fuel Injectors:	
Resistance	About 9.97 ~ 11.03 Ω @20°C (68°F)
Main Throttle Sensor:	
Input Voltage	DC 4.75 ~ 5.25 V
Output Voltage	DC 0.58 ~ 0.62 V at idle throttle opening DC 3.70 ~ 3.90 V at full throttle opening (for reference)
Resistance	4 ~ 6 kΩ
Intake Air Pressure Sensor:	
Input Voltage	DC 4.75 ~ 5.25 V
Output Voltage	DC 2.87 ~ 2.93 V at standard atmospheric pressure (101.32 kPa, 76 cmHg)
Intake Air Temperature Sensor:	
Output Voltage	About DC 2.25 ~ 2.50 V @20°C (68°F)
Resistance	5.4 ~ 6.6 kΩ @0°C (32°F) 0.29 ~ 0.39 kΩ @80°C (176°F)
Water Temperature Sensor:	
Output Voltage	About DC 2.80 ~ 2.97 V @20°C (68°F)
Speed Sensor:	
Input Voltage	About DC 9 ~ 11 V
Output Voltage	About DC 0.6 V or less, or 4.8 V or more at ignition switch ON and 0 km/h (0 mph)
Vehicle-down Sensor:	
Input Voltage	DC 4.75 ~ 5.25 V
Output Voltage	With sensor tilted 60 ~ 70° or more right or left: DC 0.65 ~ 1.35 V With sensor arrow mark pointed up: DC 3.55 ~ 4.45 V

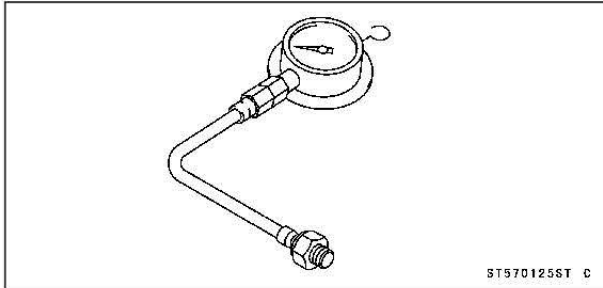
3-22 FUEL SYSTEM (DFI)

Specifications

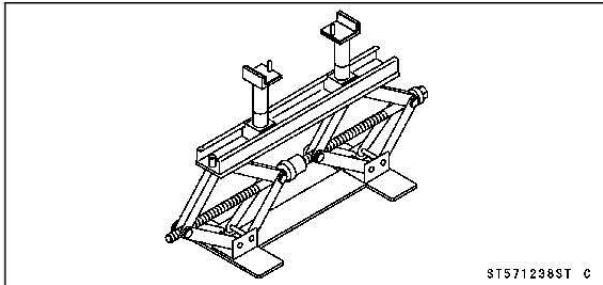
Item	Standard
Subthrottle Sensor:	
Input Voltage	DC 4.75 ~ 5.25 V
Output Voltage	DC 0.48 ~ 0.52 V at subthrottle valve full close position DC 3.60 ~ 3.80 V at subthrottle valve full open position (for reference)
Resistance	4 ~ 6 k Ω
Subthrottle Valve Actuator:	
Input Voltage	About DC 10.5 ~ 12.5 V and then 0 V or About DC 10.5 ~ 12.5 V
Resistance	About 5 ~ 8 Ω
Oxygen Sensor:	
Output Voltage (Rich)	DC 0.8 V or more
Output Voltage (Lean)	DC 0.24 V or less
Heater Resistance	6.7 ~ 10.5 Ω @20°C (68°F)
Throttle Grip and Cables	
Throttle Grip Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)
Air Cleaner	
Air Cleaner Element	Polyurethane foam
Air Cleaner Element Oil	High-quality foam air filter oil

Special Tools and Sealant

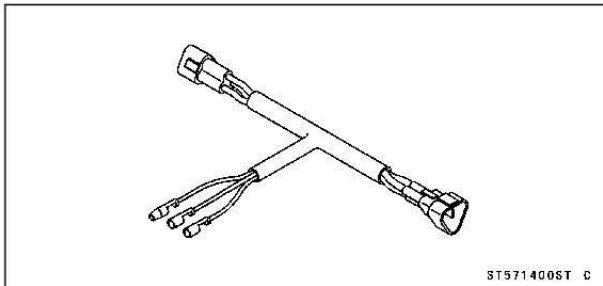
Oil Pressure Gauge, 5 kgf/cm²:
57001-125



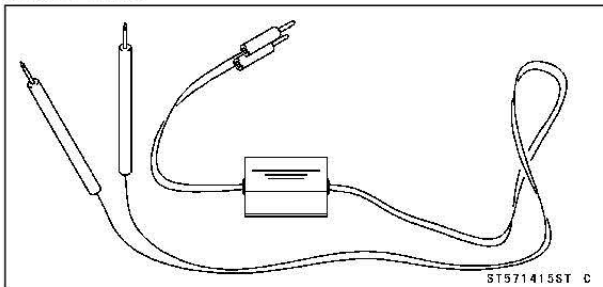
Jack:
57001-1238



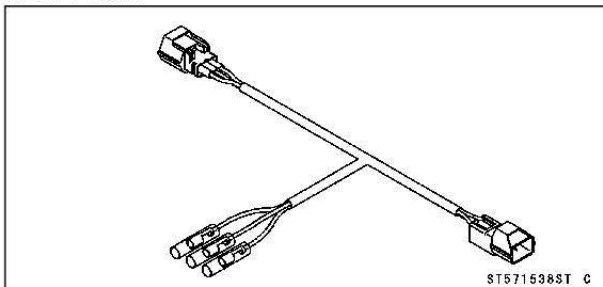
Throttle Sensor Setting Adapter #1:
57001-1400



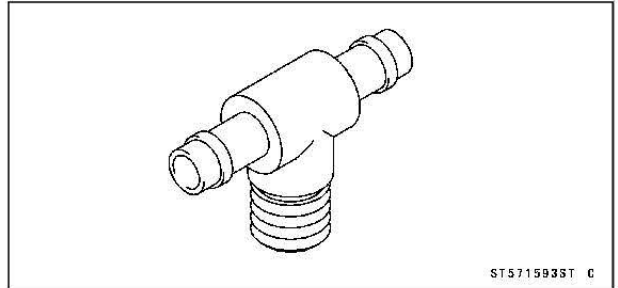
Peak Voltage Adapter:
57001-1415



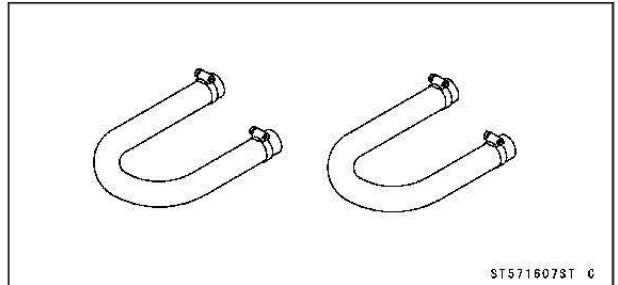
Throttle Sensor Setting Adapter:
57001-1538



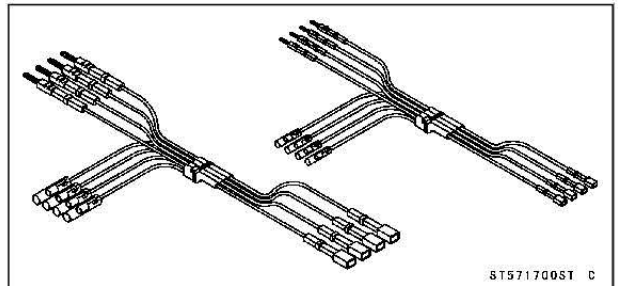
Fuel Pressure Gauge Adapter:
57001-1593



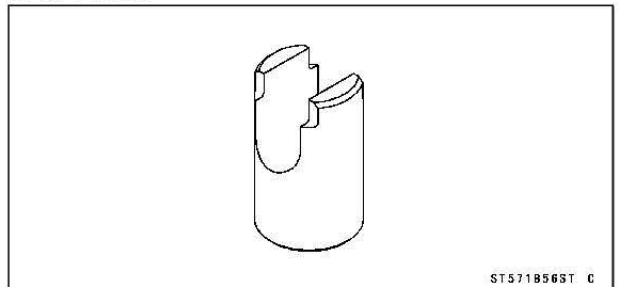
Fuel Hose:
57001-1607



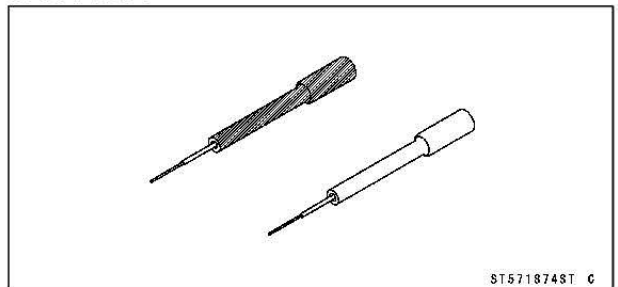
Measuring Adapter:
57001-1700



Fuel Filter Compressor:
57001-1856



Needle Adapter Set:
57001-1874

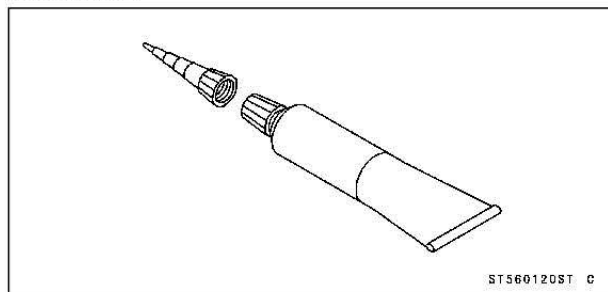


3-24 FUEL SYSTEM (DFI)

Special Tools and Sealant

Liquid Gasket, TB1211:

56019-120

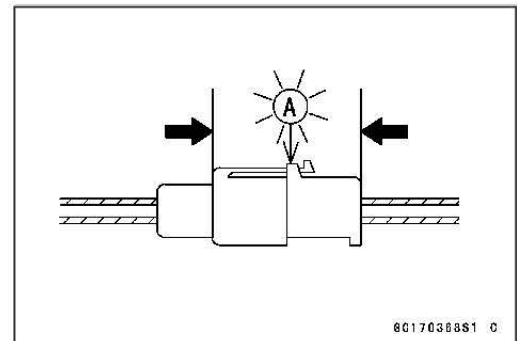


DFI Servicing Precautions

DFI Servicing Precautions

There are a number of important precautions that should be followed servicing the DFI system.

- This DFI system is designed to be used with a 12 V sealed battery as its power source. Do not use any other battery except for a 12 V sealed battery as a power source.
- Do not reverse the battery cable connections. This will damage the ECU.
- To prevent damage to the DFI parts, do not disconnect the battery cables or any other electrical connections when the ignition switch is on, or while the engine is running.
- Take care not to short the leads that are directly connected to the battery positive (+) terminal to the chassis ground.
- When charging, remove the battery from the motorcycle. This is to prevent ECU damage by excessive voltage.
- Whenever the DFI electrical connections are to be disconnected, first turn off the ignition switch, and disconnect the battery (–) terminal. Do not pull the lead, only the connector. Conversely, make sure that all the DFI electrical connections are firmly reconnected before starting the engine.
- Connect these connectors until they click [A].



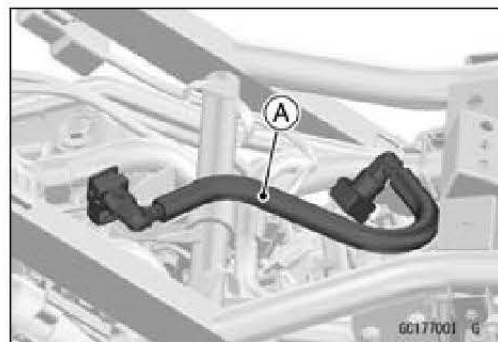
- Do not turn the ignition switch on while any of the DFI electrical connectors are disconnected. The ECU memorizes service codes.
- Do not spray water on the electrical parts, DFI parts, connectors, leads and wiring.
- If a transceiver is installed on the motorcycle, make sure that the operation of the DFI system is not influenced by electric wave radiated from the antenna. Check operation of the system with the engine at idle. Locate the antenna as far as possible away from the ECU.
- When any fuel hose is disconnected, do not turn on the ignition switch. Otherwise, the fuel pump will operate and fuel will spout from the fuel hose.
- Do not operate the fuel pump if the pump is completely dry. This is to prevent pump seizure.
- Before removing the fuel system parts, blow the outer surfaces of these parts clean with compressed air.
- When any fuel hose is disconnected, fuel may spout out by residual pressure in the fuel line. Cover the hose joint with a piece of clean cloth to prevent fuel spillage.
- When installing the fuel hoses, avoid sharp bending, kinking, flattening or twisting, and run the fuel hoses with a minimum of bending so that the fuel flow will not be obstructed.
- Run the hoses correctly (see Cable, Wire, and Hose Routing section (17-2)).
- To prevent corrosion and deposits in the fuel system, do not add to fuel any fuel antifreeze chemicals.

3-26 FUEL SYSTEM (DFI)

DFI Servicing Precautions

○ If the motorcycle is not properly handled, the high pressure inside the fuel line can cause fuel to leak or the hose to burst. Remove the fuel tank (see [Fuel Tank Removal\(3-113\)](#)) and check the fuel hose [A].

★ Replace the fuel hose if any fraying, cracks or bulges are noticed.



Troubleshooting the DFI System

Outline

When an abnormality in the system occurs, the yellow engine warning indicator light goes on to alert the rider. In addition, the condition of the problem is stored in the memory of the ECU. With the engine stopped and turned in the self-diagnosis mode, the service code is indicated by the number of times the yellow engine warning indicator light blinks.

When due to a malfunction, the yellow engine warning indicator light remains lit, ask the rider about the conditions [A] under which the problem occurred and try to determine the cause [B].

- First, conduct a self-diagnosis inspection and then a non-self-diagnosis inspection. The non-self-diagnosis items are not indicated by the yellow engine warning indicator light. Don't rely solely on the DFI self-diagnosis function, use common sense.

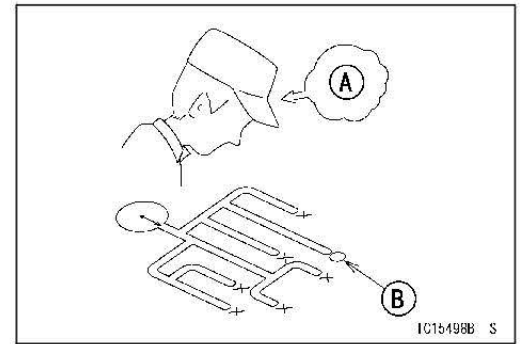
Even when the DFI system is operating normally, the yellow engine warning indicator light goes on may be displayed under strong electrical interference. Additional measures are not required. Turn the ignition switch off to stop the indicator light.

If the yellow engine warning indicator light of the motorcycle brought in for repair still goes on, check the service code.

When the repair has been done, the light doesn't go on. But the service codes stored in memory are not erased, they can be read using the Kawasaki Diagnostic System.

When the motorcycle is down, the vehicle-down sensor operates and the ECU shuts off the fuel system and ignition system. The ignition switch is left on. If the starter button is pushed, the electric starter turns but the engine does not start. To start the engine again, raise the motorcycle, turn the ignition switch off, and then on.

Much of the DFI system troubleshooting work consists of confirming continuity of the wiring. The DFI parts are assembled and adjusted with precision, and it is impossible to disassemble or repair them.



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3-28 FUEL SYSTEM (DFI)

Troubleshooting the DFI System

- When checking the DFI parts, use a digital meter which can be read two decimal place voltage or resistance.
- The DFI part connectors [A] have seals [B], including the ECU. When measuring the input or output voltage with the connector joined, use the needle adapter set [C]. Insert the needle adapter inside the seal until the needle adapter reaches the terminal.

Special Tool - Needle Adapter Set: 57001-1874

NOTICE

Insert the needle adapter straight along the terminal in the connector to prevent short-circuit between terminals.

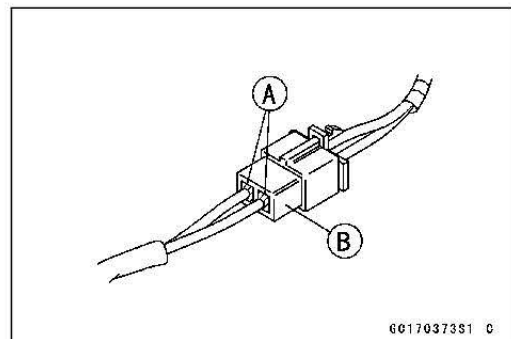
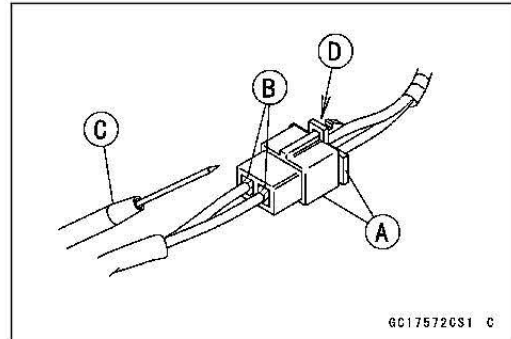
- Make sure that measuring points are correct in the connector, noting the position of the lock [D] and the lead color before measurement. Do not reverse connections of a digital meter.
- Be careful not to short-circuit the leads of the DFI or electrical system parts by contact between adapters.
- Turn the ignition switch on and measure the voltage with the connector joined.

NOTICE

Incorrect, reverse connection or short circuit by needle adapters could damage the DFI or electrical system parts.

- After measurement, remove the needle adapters and apply silicone sealant to the seals [A] of the connector [B] for waterproofing.

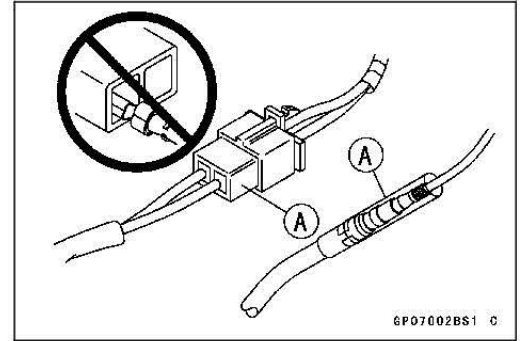
Sealant - Liquid Gasket, TB1211: 56019-120



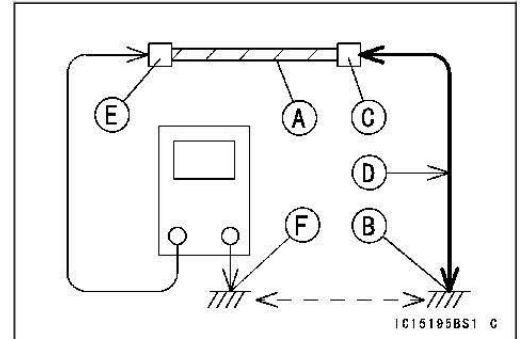
- Always check battery condition before replacing the DFI parts. A fully charged battery is a must for conducting accurate tests of the DFI system.
 - Trouble may involve one or in some cases all items. Never replace a defective part without determining what CAUSED the problem. If the problem was caused by some other item or items, they too must be repaired or replaced, or the new replacement part will soon fail again.
 - Measure the coil winding resistance when the DFI part is cold (at room temperature).
 - Make sure all connectors in the circuit are clean and tight, and examine leads for signs of burning, fraying, short, etc. Deteriorated leads and bad connections can cause reappearance of problems and unstable operation of the DFI system.
- ★ If any wiring is deteriorated, replace the wiring.

Troubleshooting the DFI System

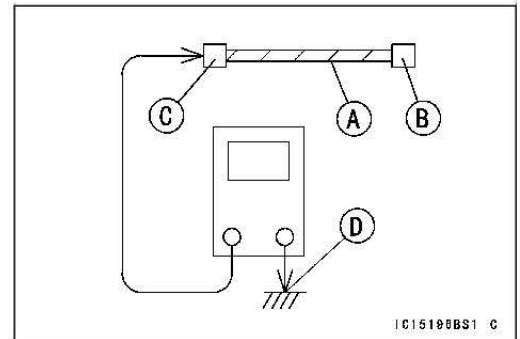
- Pull each connector [A] apart and inspect it for corrosion, dirt, and damage.
- ★ If the connector is corroded or dirty, clean it carefully. If it is damaged, replace it. Connect the connectors securely.
- Check the wiring for continuity.
- Use the wiring diagram to find the ends of the lead which is suspected of being a problem.
- Connect a tester between the ends of the leads.
- ★ If the tester does not read about 0 Ω , the lead is defective. Replace the lead or the main harness.



- If both ends of a harness [A] are far apart, ground [B] the one end [C], using a jumper lead [D] and check the continuity between the end [E] and the ground [F]. This enables to check a long harness for continuity. If the harness is open, repair or replace the harness.



- When checking a harness [A] for short circuit, open one end [B] and check the continuity between the other end [C] and ground [D]. If there is continuity, the harness has a short circuit to ground, and it must be repaired or replaced.

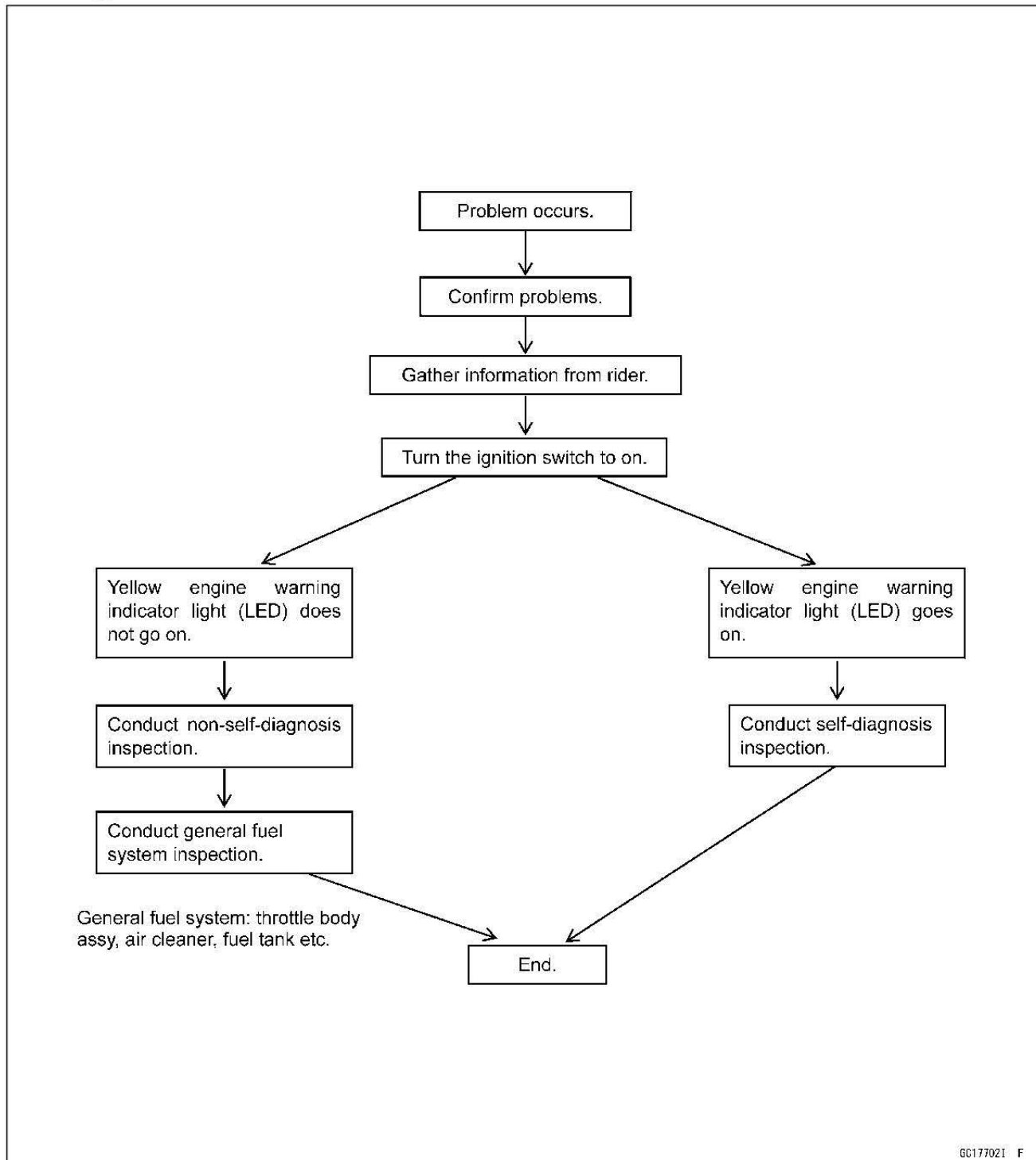


- Narrow down suspicious locations by repeating the continuity tests from the ECU connector.
- ★ If no abnormality is found in the wiring or connectors, the DFI parts are the next likely suspects. Check the part, starting with input and output voltages. However, there is no way to check the ECU itself.
- ★ If an abnormality is found, replace the affected DFI part.
- ★ If no abnormality is found in the wiring, connectors, and DFI parts, replace the ECU.

3-30 FUEL SYSTEM (DFI)

Troubleshooting the DFI System

DFI Diagnosis Flow Chart



Inquiries to Rider

- Each rider reacts to problems in different ways, so it is important to confirm what kind of symptoms the rider has encountered.
- Try to find out exactly what problem occurred under exactly what conditions by asking the rider; knowing this information may help you reproduce the problem.
- The following sample diagnosis sheet will help prevent you from overlooking any areas, and will help you decide if it is a DFI system problem, or a general engine problem.

Troubleshooting the DFI System

Sample Diagnosis Sheet

Rider name:	Registration No. (license plate No.):	Year of initial registration:
Model:	Engine No.:	Frame No.:
Date problem occurred:		Mileage:
Environment when problem occurred.		
Weather	☐ fine, ☐ cloudy, ☐ rain, ☐ snow, ☐ always, ☐ other:	
Temperature	☐ hot, ☐ warm, ☐ cold, ☐ very cold, ☐ always, ☐ other:	
Problem frequency	☐ chronic, ☐ often, ☐ once	
Road	☐ mountain road (☐ uphill, ☐ downhill), ☐ bumpy, ☐ pebble	
Altitude	☐ normal, ☐ high (about 1 000 m or more)	
Motorcycle conditions when problem occurred.		
Yellow engine warning indicator light	☐ goes on immediately after turning the ignition switch on, and goes off after about 2 seconds (normal)	
	☐ goes on immediately after turning the ignition switch on, goes off after about 2 seconds, and goes on again and stays on (DFI problem)	
	☐ does not go on after turning the ignition switch on (indicator light fault)	
Starting difficulty	☐ starter motor not rotating.	
	☐ starter motor rotating but engine do not turn over.	
	☐ starter motor and engine do not turn over.	
	☐ no fuel flow (☐ no fuel in tank, ☐ no fuel pump sound).	
	☐ no spark.	
	☐ other:	
Engine stalls	☐ right after starting.	
	☐ when opening throttle grip.	
	☐ when closing throttle grip.	
	☐ when moving off.	
	☐ when stopping the motorcycle.	
	☐ when cruising.	
	☐ other:	
Poor running at low speed	☐ very low idle speed, ☐ very high idle speed, ☐ rough idle speed.	
	☐ battery voltage is low (charge the battery).	
	☐ spark plug loose (tighten it).	
	☐ spark plug dirty, broken, or gap maladjusted (remedy it).	
	☐ backfiring.	
	☐ afterfiring.	
	☐ hesitation when acceleration.	
	☐ engine oil viscosity too high.	
	☐ brake dragging.	
	☐ engine overheating.	
	☐ clutch slipping.	
	☐ other:	

3-32 FUEL SYSTEM (DFI)

Troubleshooting the DFI System

Poor running or no power at high speed	☐ spark plug loose (tighten it).
	☐ spark plug dirty, broken, or gap maladjusted (remedy it).
	☐ spark plug incorrect (replace it).
	☐ knocking (fuel poor quality or incorrect).
	☐ brake dragging.
	☐ clutch slipping.
	☐ engine overheating.
	☐ engine oil level too high.
	☐ engine oil viscosity too high.
	☐ other:

DFI System Troubleshooting Guide

NOTE

- This is not an exhaustive list, giving every possible cause for each problem listed. It is meant simply as a rough guide to assist the troubleshooting for some of the more common difficulties in DFI system.
- The ECU may be involved in the DFI electrical and ignition system troubles. If these parts and circuits are checked out good, be sure to check the ECU for ground and power supply. If the ground and power supply are checked good, replace the ECU.

Engine Won't Turn Over

Symptoms or Possible Causes	Actions (chapter)
Neutral, starter lockout switch trouble	Inspect each switch (see chapter 16).
Vehicle-down sensor operated	Turn ignition switch off (see chapter 3).
Vehicle-down sensor trouble	Inspect (see chapter 3).
Crankshaft sensor trouble	Inspect (see chapter 16).
Ignition coil shorted or not in good contact	Inspect or reinstall (see chapter 16).
Ignition coil trouble	Inspect (see chapter 16).
Spark plug dirty, broken or gap maladjusted	Inspect and replace (see chapter 2).
Spark plug incorrect	Replace it with the correct plug (see chapter 2).
ECU ground and power supply trouble	Inspect (see chapter 3).
ECU trouble	Inspect (see chapter 3).
No or little fuel in tank	Supply fuel (see Owner's Manual).
Fuel injector trouble	Inspect and replace (see chapter 3).
Fuel pump not operating	Inspect (see chapter 3).
Fuel pump relay trouble	Inspect and replace (see chapter 3).
Fuel filter clogged	Inspect and replace fuel filter (see chapter 3).
Fuel pressure regulator trouble	Inspect fuel pressure and replace fuel pump (see chapter 3).
Fuel line clogged	Inspect and repair (see chapter 3).

Poor Running at Low Speed

Symptoms or Possible Causes	Actions (chapter)
Spark weak:	
Ignition coil shorted or not in good contact	Inspect or reinstall (see chapter 16).
Ignition coil trouble	Inspect (see chapter 16).
Spark plug dirty, broken or gap maladjusted	Inspect and replace (see chapter 2).
Spark plug incorrect	Replace it with the correct plug (see chapter 2).
ECU trouble	Inspect (see chapter 3).
Fuel/air mixture incorrect:	
Little fuel in tank	Supply fuel (see Owner's Manual).
Air cleaner clogged, poorly sealed, or missing	Clean element or inspect sealing (see chapter 2).
Air intake duct loose	Reinstall (see chapter 3).
Throttle body assy holder loose	Reinstall (see chapter 3).
Throttle body assy holder O-ring damage	Replace (see chapter 3).
Fuel injector O-ring damage	Replace (see chapter 3).
Fuel filter clogged	Inspect and replace fuel filter (see chapter 3).
Fuel pressure regulator trouble	Inspect fuel pressure and replace fuel pump (see chapter 3).

3-34 FUEL SYSTEM (DFI)

DFI System Troubleshooting Guide

Symptoms or Possible Causes	Actions (chapter)
Fuel line clogged	Inspect and repair (see chapter 3).
Intake air pressure sensor trouble	Inspect (see chapter 3).
Water temperature sensor trouble	Inspect (see chapter 3).
Intake air temperature sensor trouble	Inspect (see chapter 3).
Main throttle sensor trouble	Inspect (see chapter 3).
Subthrottle sensor trouble	Inspect (see chapter 3).
Subthrottle valve actuator trouble	Inspect (see chapter 3).
Unstable (rough) idling:	
Fuel pressure too low or too high	Inspect (see chapter 3).
Fuel injector trouble	Inspect (see chapter 3).
Main throttle sensor trouble	Inspect (see chapter 3).
Subthrottle sensor trouble	Inspect (see chapter 3).
Subthrottle valve actuator trouble	Inspect (see chapter 3).
Intake air pressure sensor trouble	Inspect (see chapter 3).
Water temperature sensor trouble	Inspect (see chapter 3).
Intake air temperature sensor trouble	Inspect (see chapter 3).
Engine stalls easily:	
Spark plug dirty, broken or gap maladjusted	Inspect and replace (see chapter 2).
Ignition coil trouble	Inspect (see chapter 16).
Main throttle sensor trouble	Inspect (see chapter 3).
Subthrottle sensor trouble	Inspect (see chapter 3).
Subthrottle valve actuator trouble	Inspect (see chapter 3).
Intake air pressure sensor trouble	Inspect (see chapter 3).
Water temperature sensor trouble	Inspect (see chapter 3).
Intake air temperature sensor trouble	Inspect (see chapter 3).
Fuel pump trouble	Inspect (see chapter 3).
Fuel injector trouble	Inspect (see chapter 3).
Fuel pressure too low or too high	Inspect (see chapter 3).
Fuel pressure regulator trouble	Inspect fuel pressure and replace fuel pump (see chapter 3).
Fuel line clogged	Inspect and repair (see chapter 3).
Poor acceleration:	
Fuel pressure too low	Inspect (see chapter 3).
Water or foreign matter in fuel	Change fuel. Inspect and clean fuel system (see chapter 3).
Fuel filter clogged	Inspect and replace fuel filter (see chapter 3).
Fuel pump trouble	Inspect (see chapter 3).
Fuel injector trouble	Inspect (see chapter 3).
Main throttle sensor trouble	Inspect (see chapter 3).
Subthrottle sensor trouble	Inspect (see chapter 3).
Subthrottle valve actuator trouble	Inspect (see chapter 3).
Intake air pressure sensor trouble	Inspect (see chapter 3).
Water temperature sensor trouble	Inspect (see chapter 3).
Intake air temperature sensor trouble	Inspect (see chapter 3).

DFI System Troubleshooting Guide

Symptoms or Possible Causes	Actions (chapter)
Spark plug dirty, broken or gap maladjusted	Inspect and replace (see chapter 2).
Ignition coil trouble	Inspect (see chapter 16).
Stumble:	
Fuel pressure too low	Inspect (see chapter 3).
Fuel injector trouble	Inspect (see chapter 3).
Main throttle sensor trouble	Inspect (see chapter 3).
Subthrottle sensor trouble	Inspect (see chapter 3).
Subthrottle valve actuator trouble	Inspect (see chapter 3).
Intake air pressure sensor trouble	Inspect (see chapter 3).
Water temperature sensor trouble	Inspect (see chapter 3).
Intake air temperature sensor trouble	Inspect (see chapter 3).
Surge:	
Unstable fuel pressure	Fuel pressure regulator trouble (Inspect and replace fuel pump) or kinked fuel line (Inspect and replace fuel pump) (see chapter 3).
Fuel injector trouble	Inspect (see chapter 3).
Water temperature sensor trouble	Inspect (see chapter 3).
Backfiring when deceleration:	
Spark plug dirty, broken or gap maladjusted	Inspect and replace (see chapter 2).
Fuel pressure too low	Inspect (see chapter 3).
Fuel pump trouble	Inspect (see chapter 3).
Main throttle sensor trouble	Inspect (see chapter 3).
Subthrottle sensor trouble	Inspect (see chapter 3).
Subthrottle valve actuator trouble	Inspect (see chapter 3).
Intake air pressure sensor trouble	Inspect (see chapter 3).
Water temperature sensor trouble	Inspect (see chapter 3).
Intake air temperature sensor trouble	Inspect (see chapter 3).
Air switching valve trouble	Inspect and replace (see chapter 16).
Air suction valve trouble	Inspect and replace (see chapter 5).
After fire:	
Spark plug burned or gap maladjusted	Replace (see chapter 2).
Fuel injector trouble	Inspect (see chapter 3).
Intake air pressure sensor trouble	Inspect (see chapter 3).
Water temperature sensor trouble	Inspect (see chapter 3).
Intake air temperature sensor trouble	Inspect (see chapter 3).
Other:	
Intermittent any DFI fault and its recovery	Check that DFI connectors are clean and tight, and examine leads for signs of burning or fraying (see chapter 3).

Poor Running or No Power at High Speed

Symptoms or Possible Causes	Actions (chapter)
Firing incorrect:	
Ignition coil shorted or not in good contact	Inspect or reinstall (see chapter 16).
Ignition coil trouble	Inspect (see chapter 16).

3-36 FUEL SYSTEM (DFI)

DFI System Troubleshooting Guide

Symptoms or Possible Causes	Actions (chapter)
Spark plug dirty, broken or gap maladjusted	Inspect and replace (see chapter 2).
Spark plug incorrect	Replace it with the correct plug (see chapter 2).
ECU trouble	Inspect (see chapter 3).
Fuel/air mixture incorrect:	
Air cleaner clogged, poorly sealed, or missing	Clean element or inspect sealing (see chapter 2).
Air intake duct loose	Reinstall (see chapter 3).
Throttle body assy holder loose	Reinstall (see chapter 3).
Throttle body assy holder O-ring damage	Replace (see chapter 3).
Water or foreign matter in fuel	Change fuel. Inspect and clean fuel system (see chapter 3).
Fuel injector O-ring damage	Replace (see chapter 3).
Fuel injector clogged	Inspect and repair (see chapter 3).
Fuel line clogged	Inspect and repair (see chapter 3).
Fuel pump operates intermittently and often DFI fuse blows.	Fuel pump bearings may wear. Replace the fuel pump (see chapter 3).
Fuel pump trouble	Inspect (see chapter 3).
Intake air pressure sensor trouble	Inspect (see chapter 3).
Water temperature sensor trouble	Inspect (see chapter 3).
Intake air temperature sensor trouble	Inspect (see chapter 3).
Main throttle sensor trouble	Inspect (see chapter 3).
Subthrottle sensor trouble	Inspect (see chapter 3).
Subthrottle valve actuator trouble	Inspect (see chapter 3).
Knocking:	
Fuel poor quality or incorrect	Fuel change (Use the gasoline recommended in the Owner's Manual).
Spark plug incorrect	Replace it with the correct plug (see chapter 2).
Ignition coil trouble	Inspect (see chapter 16).
ECU trouble	Inspect (see chapter 3).
Intake air pressure sensor trouble	Inspect (see chapter 3).
Water temperature sensor trouble	Inspect (see chapter 3).
Intake air temperature sensor trouble	Inspect (see chapter 3).
Miscellaneous:	
Subthrottle sensor trouble	Inspect (see chapter 3).
Subthrottle valve actuator trouble	Inspect (see chapter 3).
Speed sensor trouble	Inspect (see chapter 3).
Throttle valve will not fully open	Inspect throttle cables and lever linkage (see chapter 3).
Engine overheating - Water temperature sensor or crankshaft sensor trouble	(see Overheating of Troubleshooting Guide in chapter 17)
Air switching valve trouble	Inspect and replace (see chapter 16).
Air suction valve trouble	Inspect and replace (see chapter 5).
Exhaust Smokes Excessively:	
(Black smoke)	
Air cleaner element clogged	Clean element (see chapter 2).
Fuel pressure too high	Inspect (see chapter 3).

DFI System Troubleshooting Guide

Symptoms or Possible Causes	Actions (chapter)
Fuel injector trouble	Inspect (see chapter 3).
Water temperature sensor trouble	Inspect (see chapter 3).
Intake air temperature sensor trouble	Inspect (see chapter 3).
(Brown smoke)	
Air intake duct loose	Reinstall (see chapter 3).
Fuel pressure too low	Inspect (see chapter 3).
Water temperature sensor trouble	Inspect (see chapter 3).
Intake air temperature sensor trouble	Inspect (see chapter 3).

3-38 FUEL SYSTEM (DFI)

Self-Diagnosis

Self-diagnosis Outline

The self-diagnosis system has two modes and can be switched to another mode by grounding the self-diagnosis terminal.

User Mode

The ECU notifies the rider of troubles in DFI system and ignition system by lighting the yellow engine warning indicator light (LED) when DFI system and ignition system parts are faulty, and initiates fail-safe function. In case of serious troubles, the ECU stops the injection and ignition operation.

Dealer Mode

The yellow engine warning indicator light (LED) emits service code(s) to show the problem(s) which the DFI system and ignition system have at the moment of diagnosis.

Self-diagnosis Procedures

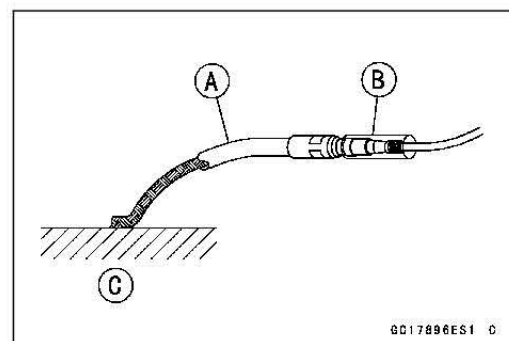
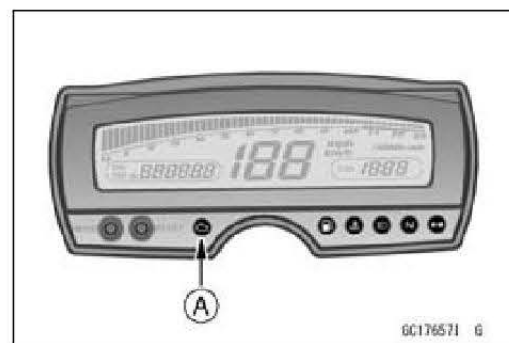
NOTE

○Use a fully charged battery when conducting self-diagnosis. Otherwise, the warning indicator light (LED) does not light.

- Turn the ignition switch on and start the engine.
- When a problem occurs with DFI system and ignition system, the yellow engine warning indicator light (LED) [A] stays on after starting the engine to alert the rider.
- Remove the seat (see Seat Removal (15-7)).
- Connect an auxiliary lead [A] to the self-diagnosis terminal [B] for grounding.
- To enter the self-diagnosis dealer mode, ground [C] the self-diagnosis terminal to the frame ground, and then keep it grounded continuously.
- Count the blinks of the yellow engine warning indicator light (LED) to read the service code. Keep the auxiliary lead ground until you finish reading the service code.

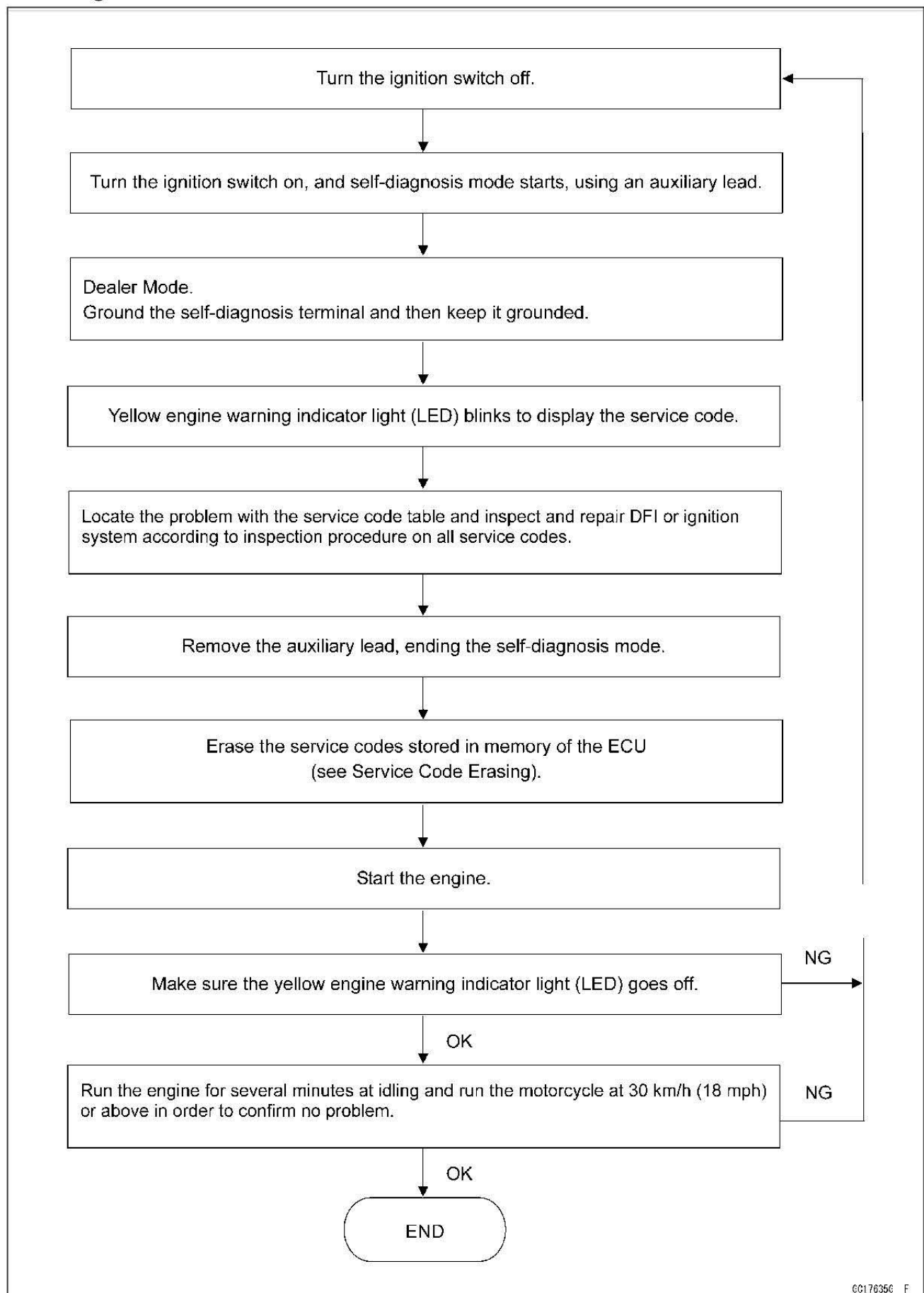
NOTE

○Keep the self-diagnosis terminal grounded during self-diagnosis, with an auxiliary lead.



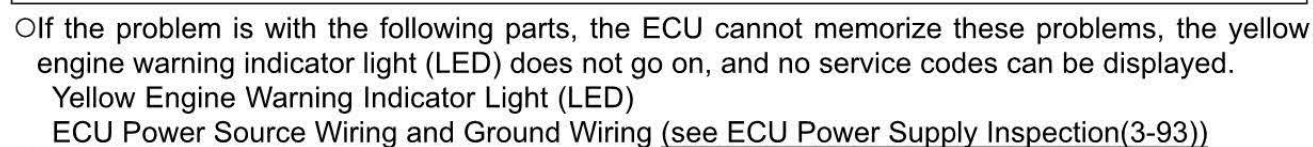
Self-Diagnosis

Self-Diagnosis Flow Chart

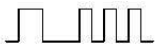
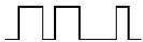
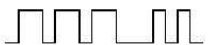


Self-Diagnosis

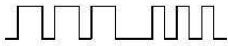
- Service codes are shown by a series of long and short blinks of the yellow engine warning indicator light (LED) as shown below.
- Read 10th digit and unit digit as the yellow engine warning indicator light (LED) blinks.
- When there are a number of problems, all the service codes can be stored and the display will begin starting from the lowest number service code in the numerical order. Then after completing all codes, the display is repeated until the self-diagnosis indicator terminal is open.
- For example, if two problems occurred in the order of 21, 12, the service codes are displayed from the lowest number in the order listed.
(12 → 21) → (12 → 21) → ··· (repeated)



- When repair has been done, the yellow engine warning indicator light goes off and service code is not displayed.
- The service codes stored in memory of the ECU can be erased using Kawasaki Diagnostic System.

Service Code	DTC (Diagnostic Trouble Code)	Yellow Engine Warning Indicator Light (LED)	Problems
11	P0120	 ON OFF	Main throttle sensor malfunction, wiring open or short
12	P1101		Intake air pressure sensor malfunction, wiring open or short
13	P0110		Intake air temperature sensor malfunction, wiring open or short
14	P0115		Water temperature sensor malfunction, wiring open or short
21	P0335		Crankshaft sensor malfunction, wiring open or short
24	P0500		Speed sensor malfunction, wiring open or short
31	P1504		Vehicle-down sensor malfunction, wiring open or short
32	P1104		Subthrottle sensor malfunction, wiring open or short

Self-Diagnosis

Service Code	DTC (Diagnostic Trouble Code)	Yellow Engine Warning Indicator Light (LED)	Problems
33	P0130		Oxygen sensor malfunction or inactivate, wiring open or short
41	P0201		Fuel injector malfunction, wiring open or short
45	P1514		Fuel pump relay malfunction, relay is stuck
51	P0351		Ignition coil malfunction, wiring open or short
56	P0480		Radiator fan relay malfunction, wiring open or short
62	P1103		Subthrottle valve actuator malfunction, wiring open or short
64	P0410		Air switching valve malfunction, wiring open or short
67	P0135		Oxygen sensor heater malfunction, wiring open or short

Notes:

- The ECU may be involved in these problems. If all the parts and circuits checked out good, be sure to check the ECU for ground and power supply. If the ground and power supply are checked good, replace the ECU.
- When no service code is displayed, the electrical parts of the DFI system has no fault, and the mechanical parts of the DFI system and the engine are suspect.

Backups

- The ECU takes the following measures to prevent engine damage when the DFI ignition system parts have troubles.

Service Code	Parts or Function	Output Signal Usable Range or Criteria	Backups by ECU
11	Main Throttle Sensor	Output Voltage 0.410 ~ 4.375 V	If the main throttle sensor system fails (the signal is out of the usable range, wiring short or open), the ECU locks ignition timing into the ignition timing at wide open throttle position and sets the DFI in the D-J method (1).
12	Intake Air Pressure Sensor	Output Voltage 0.215 ~ 4.219 V	If the intake air pressure sensor system fails (the signal Pv is out of the usable range, wiring short or open), the ECU sets the DFI in the α-N method (2).
13	Intake Air Temperature Sensor	Output Voltage 0.430 ~ 4.824 V	If the intake air temperature sensor fails (the signal is out of the usable range, wiring short or open), the ECU sets Ta at 40°C.
14	Water Temperature Sensor	Output Voltage 0.117 ~ 4.824 V	If the water temperature sensor system fails (the signal is out of the usable range, wiring short or open), the ECU sets Tw at 80°C.

3-42 FUEL SYSTEM (DFI)

Self-Diagnosis

Service Code	Parts or Function	Output Signal Usable Range or Criteria	Backups by ECU
21	Crankshaft Sensor	Crankshaft sensor must send 18 signals to the ECU at the one cranking.	If the crankshaft sensor fails, the engine stops by itself.
24	Speed Sensor	Speed sensor must send 8 signals (output signal) to the ECU at the one rotation of the transmission gear. The gear position is decided by the signal of the speed sensor.	If the speed sensor system fails (no signal, wiring short or open), the speedometer shows 0, and the ECU sets the low gear position.
31	Vehicle-down Sensor	Output Voltage (signal) Vd = 0.469 ~ 4.395 V	If the vehicle-down sensor system has failures (the output voltage is more than usable range, wiring open), the ECU shuts off the fuel pump relay, the fuel injectors and the ignition system.
32	Subthrottle Sensor	Output Voltage 0.352 V ~ 4.414 V	If the subthrottle sensor system fails (the signal is out of the usable range, wiring short or open), the actuator locks subthrottle valve at full open position.
33	Oxygen Sensor	The oxygen sensor is active and sensor must send signals (output voltage) continuously to the ECU.	If the oxygen sensor is not activated, the ECU stops the current to the heater, and it stops the oxygen sensor feedback mode.
41	Fuel Injector	The injector must send signals continuously to the ECU.	If the injector fails (no signal, wiring short or open), the ECU shuts off the signal to the injector. Fuel is not supplied to the cylinder.
45	Fuel Pump Relay	When relay power supply is off, fuel pump relay is off.	—
51	Ignition Coil	The ignition coil primary winding must send signals (output voltage) continuously to the ECU.	If the ignition coil primary winding has failures (no signal, wiring short or open), the ECU shuts off the injector to stop fuel to the cylinder.
56	Radiator Fan Relay	When the relay OFF condition, the fan relay is OFF	—
62	Subthrottle Valve Actuator	The actuator operates open and close of the subthrottle valve by the pulse signal from the ECU.	If the subthrottle valve actuator fails (the signal is out of the usable range, wiring short or open), the ECU stops the current to the actuator.

Self-Diagnosis

Service Code	Parts or Function	Output Signal Usable Range or Criteria	Backups by ECU
64	Air Switching Valve	The air switching valve controls the flow of the secondary air by opening and shutting the solenoid valve.	—
67	Oxygen Sensor Heater	The oxygen sensor heater raise temperature of the sensor for its earlier activation.	If the oxygen sensor heater fails (wiring short or open), the ECU stops oxygen sensor feedback mode.

Note:

- (1): D-J Method: When the engine load is light like at idling or low speed, the ECU determines the injection quantity by calculating from the throttle vacuum (intake air pressure sensor output voltage) and engine speed (crankshaft sensor output voltage). This method is called D-J method.
- (2): α -N Method: As the engine speed increases, and the engine load turns middle to heavy, the ECU determines the injection quantity by calculating from the throttle opening (throttle sensor output voltage) and the engine speed. This method is called α -N method.

3-44 FUEL SYSTEM (DFI)

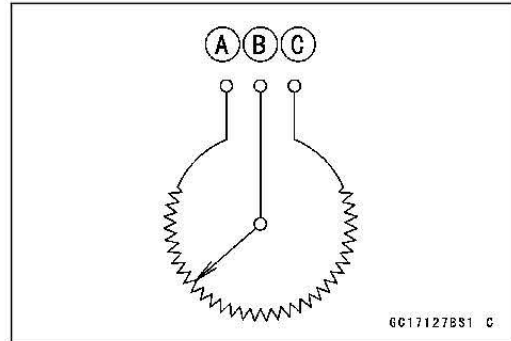
Main Throttle Sensor (Service Code 11)

The main throttle sensor is a rotating variable resistor that change output voltage according to throttle operating. The ECU senses this voltage change and determines fuel injection quantity, and ignition timing according to engine rpm, and throttle opening.

Input Terminal [A]

Output Terminal [B]

Ground Terminal [C]

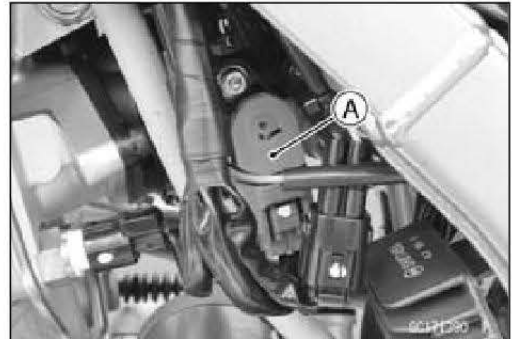


Main Throttle Sensor Removal/Adjustment

NOTICE

Do not remove or adjust the main throttle sensor [A] since it has been adjusted and set with precision at the factory.

Never drop the throttle body assy especially on a hard surface. Such a shock to the main throttle sensor can damage it.



Main Throttle Sensor Input Voltage Inspection

NOTE

○Be sure the battery is fully charged.

- Turn the ignition switch off.
- Disconnect the main throttle sensor connector and connect the throttle sensor setting adapter [A] between these connectors.

Special Tool - Throttle Sensor Setting Adapter: 57001-1538

- Connect a digital meter to the throttle sensor setting adapter leads.

Main Throttle Sensor Input Voltage

Connections to Adapter:

Digital Meter (+) → BK (sensor BL) lead

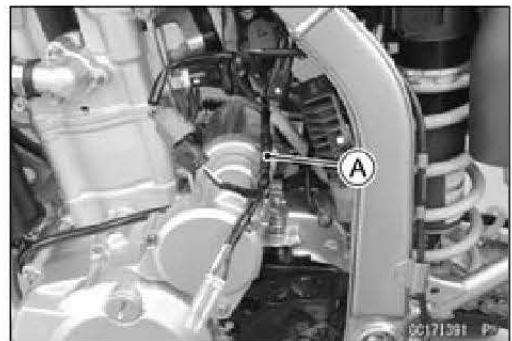
Digital Meter (-) → W (sensor BR/BK) lead

- Measure the input voltage with the engine stopped and with the connector joined.
- Turn the ignition switch on.

Input Voltage

Standard: DC 4.75 ~ 5.25 V

- Turn the ignition switch off.
- ★ If the reading is within the standard, check the output voltage (see Main Throttle Sensor Output Voltage Inspection(3-45)).



Main Throttle Sensor (Service Code 11)

★ If the reading is out of the standard, remove the ECU and check the wiring for continuity between main harness connectors.

○ Disconnect the ECU and sensor connectors.

Wiring Inspection

ECU Connector [A] ↔

Main Throttle Sensor Connector [B]

ECU Terminal 13 [C] ↔ Sensor Terminal [D]

ECU Terminal 24 [E] ↔ Sensor Terminal [F]

★ If the wiring is good, check the ECU for its ground and power supply (see ECU Power Supply Inspection(3-93)).

★ If the ground and power supply are good, replace the ECU.

Main Throttle Sensor Output Voltage Inspection

● Measure the output voltage at the main throttle sensor in the same way as input voltage inspection, note the following.

○ Disconnect the main throttle sensor connector and connect the throttle sensor setting adapter [A] between these connectors.

Special Tool - Throttle Sensor Setting Adapter: 57001-1538

Main Throttle Sensor Output Voltage

Connections to Adapter:

Digital Meter (+) → R (sensor LB) lead

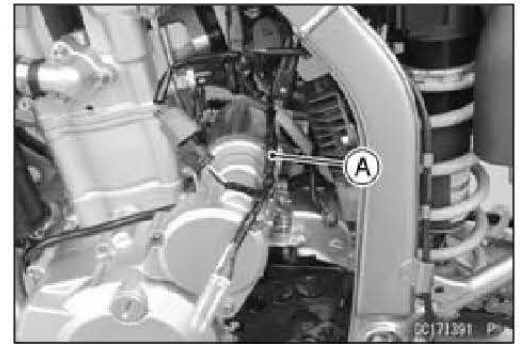
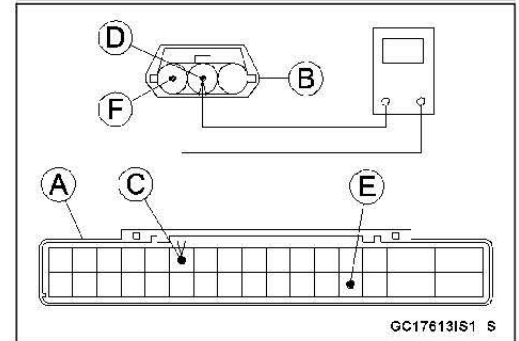
Digital Meter (-) → W (sensor BR/BK) lead

- Start the engine and warm it up thoroughly.
- Check idle speed to ensure the throttle opening is correct.

Idle Speed

Standard: 1 500 ±50 r/min (rpm)

★ If the idle speed is out of the specified range, adjust it (see Idle Speed Adjustment(2-17)).



3-46 FUEL SYSTEM (DFI)

Main Throttle Sensor (Service Code 11)

- Turn the ignition switch off.
- Measure the output voltage with the engine stopped and with the connector joined.
- Turn the ignition switch on.

Output Voltage

Standard: DC 0.58 ~ 0.62 V at idle throttle opening

DC 3.70 ~ 3.90 V at full throttle opening (for reference)

NOTE

- Open the throttle, confirm the output voltage will be raise.
- The standard voltage refers to the value when the voltage reading at the Input Voltage Inspection shows 5 V exactly.
- When the input voltage reading shows other than 5 V, derive a voltage range as follows.

Example:

In the case of a input voltage of 4.75 V.

$$0.58 \times 4.75 \div 5.00 = 0.551 \text{ V}$$

$$0.62 \times 4.75 \div 5.00 = 0.589 \text{ V}$$

Thus, the valid range is 0.551 ~ 0.589 V

- Turn the ignition switch off.
- ★ If the reading is out of the standard, check the main throttle sensor resistance (see Main Throttle Sensor Resistance Inspection(3-47)).
- ★ If the reading is within the standard, remove the ECU and check the wiring for continuity between main harness side connectors.
- Disconnect the ECU and sensor connectors.

Wiring Inspection

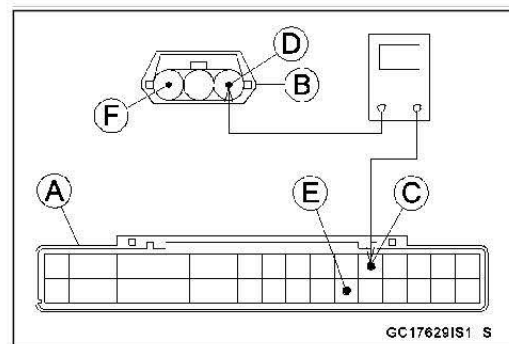
ECU Connector [A] ↔

Main Throttle Sensor Connector [B]

ECU Terminal 5 [C] ↔ Sensor Terminal [D]

ECU Terminal 24 [E] ↔ Sensor Terminal [F]

- ★ If the wiring is good, check the ECU for its ground and power supply (see ECU Power Supply Inspection(3-93)).
- ★ If the ground and power supply are good, replace the ECU.

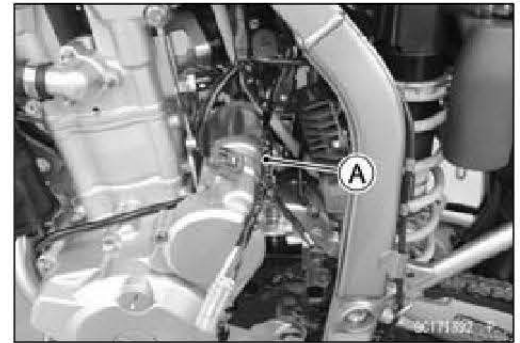


Main Throttle Sensor (Service Code 11)

Main Throttle Sensor Resistance Inspection

- Disconnect the main throttle sensor connector.
- Connect a throttle sensor setting adapter [A] to the main throttle sensor.

Special Tool - Throttle Sensor Setting Adapter: 57001-1538



Main Throttle Sensor Resistance

Connections to Adapter:

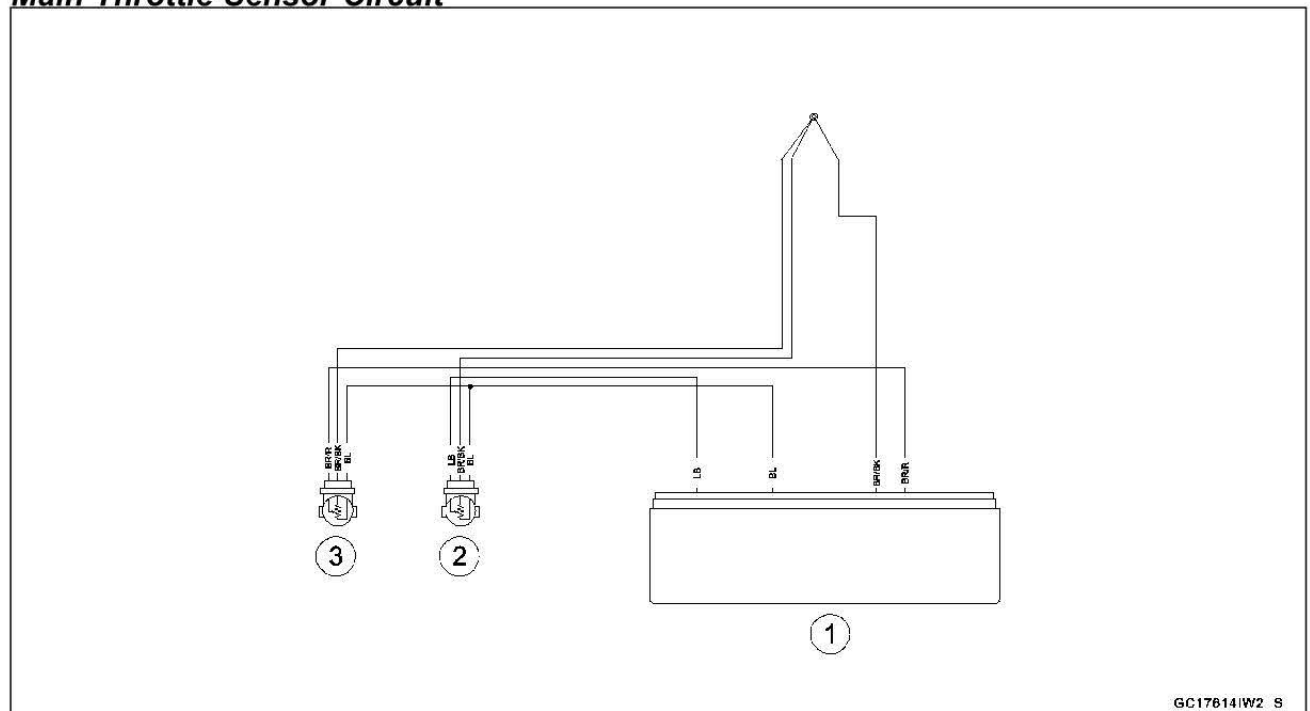
Digital Meter (+) → BK (sensor BL) lead

Digital Meter (−) → W (sensor BR/BK) lead

Standard: 4 ~ 6 kΩ

- ★ If the reading is out of the standard, replace the throttle body assy.
- ★ If the reading is within the standard, but the problem still exists, replace the ECU.

Main Throttle Sensor Circuit



GC17614/W2 9

1. ECU
2. Main Throttle Sensor
3. Subthrottle Sensor

3-48 FUEL SYSTEM (DFI)

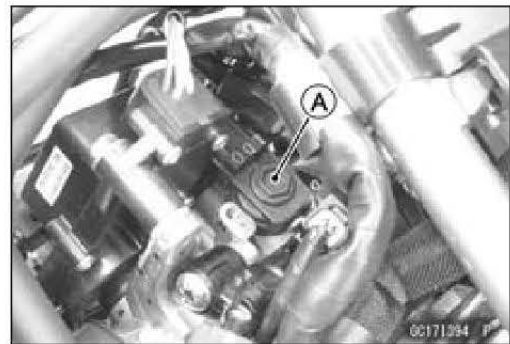
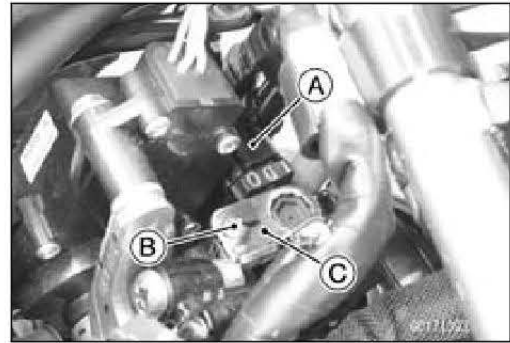
Intake Air Pressure Sensor (Service Code 12)

Intake Air Pressure Sensor Removal

NOTICE

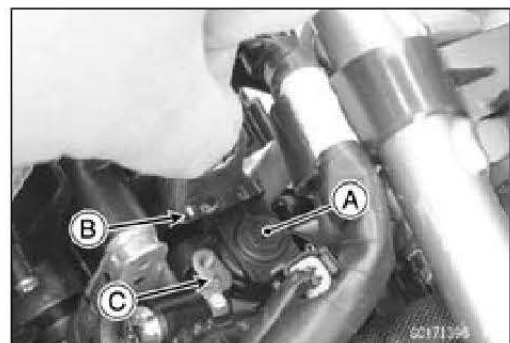
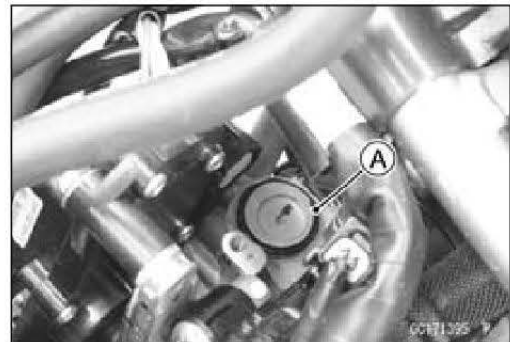
Never drop the intake air pressure sensor especially on a hard surface. Such a shock to the sensor can damage it.

- Remove:
Fuel Tank (see Fuel Tank Removal(3-113))
- Disconnect:
Intake Air Pressure Sensor Connector [A]
- Remove:
Screw [B]
Plate [C]
- Remove the intake air pressure sensor [A] from the throttle body assy.



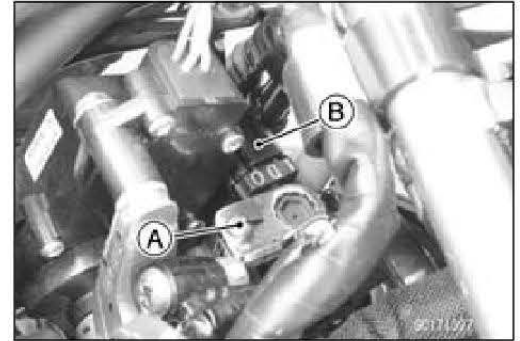
Intake Air Pressure Sensor Installation

- Replace the O-ring [A] with a new one.
- Install the intake air pressure sensor [A] to the throttle body assy.
- Install the plate so that fit the projection [B] on the plate and hollow [C] on the throttle body assy.



Intake Air Pressure Sensor (Service Code 12)

- Tighten the screw [A] securely.
- Connect the intake air pressure sensor connector [B].



Intake Air Pressure Sensor Input Voltage Inspection

NOTE

○Be sure the battery is fully charged.

- Turn the ignition switch off.
- Disconnect the intake air pressure sensor connector and connect the measuring adapter [A] between these connectors.

Main Harness [B]

Intake Air Pressure Sensor [C]

Special Tool - Measuring Adapter: 57001-1700

- Connect a digital meter [D] to the measuring adapter leads.

Intake Air Pressure Sensor Input Voltage

Connections to Adapter:

Digital Meter (+) → R (sensor BL) lead

Digital Meter (–) → BK (sensor BR/BK) lead

- Measure the input voltage with the engine stopped and with the connector joined.
- Turn the ignition switch on.

Input Voltage

Standard: DC 4.75 ~ 5.25 V

- Turn the ignition switch off.
- ★ If the reading is within the standard, check the output voltage (see Intake Air Pressure Sensor Output Voltage Inspection(3-50)).

- ★ If the reading is out of the standard, remove the ECU and check the wiring for continuity between main harness connectors.

○Disconnect the ECU and sensor connectors.

Wiring Continuity Inspection

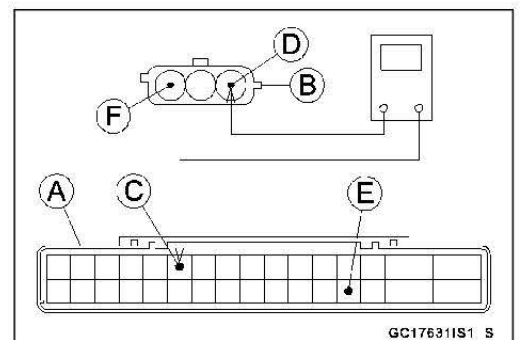
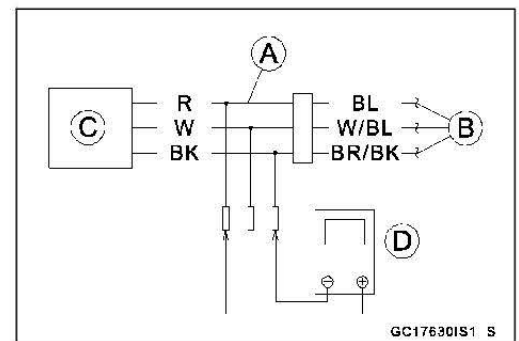
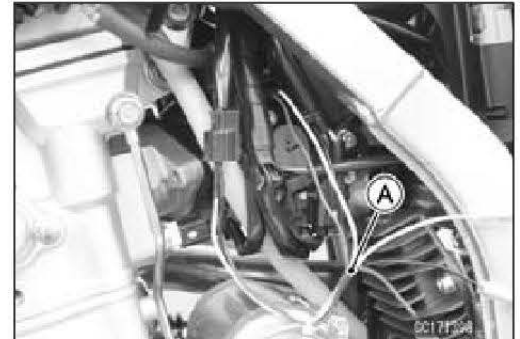
ECU Connector [A] ↔

Intake Air Pressure Connector [B]

ECU Terminal 13 [C] ↔ Sensor Terminal [D]

ECU Terminal 24 [E] ↔ Sensor Terminal [F]

- ★ If the wiring is good, check the ECU for its ground and power supply (see ECU Power Supply Inspection(3-93)).
- ★ If the ground and power supply are good, replace the ECU.



3-50 FUEL SYSTEM (DFI)

Intake Air Pressure Sensor (Service Code 12)

Intake Air Pressure Sensor Output Voltage Inspection

- Measure the output voltage at the intake air pressure sensor in the same way as input voltage inspection, note the following.
- Disconnect the intake air pressure sensor connector and connect the measuring adapter [A] between these connectors.
 - Main Harness [B]
 - Intake Air Pressure Sensor [C]
 - Digital Meter [D]

Special Tool - Measuring Adapter: 57001-1700

Intake Air Pressure Sensor Output Voltage

Connections to Adapter:

Digital Meter (+) → W (sensor W/BL) lead

Digital Meter (-) → BK (sensor BR/BK) lead

- Measure the output voltage with the engine stopped and with the connector joined.
- Turn the ignition switch on.

Output Voltage

Usable Range: DC 2.87 ~ 2.93 V at standard atmospheric pressure (101.32 kPa, 76 cmHg)

NOTE

○ The output voltage changes according to the local atmospheric pressure.

- Turn the ignition switch off.
- ★ If the reading is out of the usable range, replace the throttle body assy.
- ★ If the reading is within the usable range, remove the ECU and check the wiring for continuity between main harness connectors.
- Disconnect the ECU and sensor connectors.

Wiring Continuity Inspection

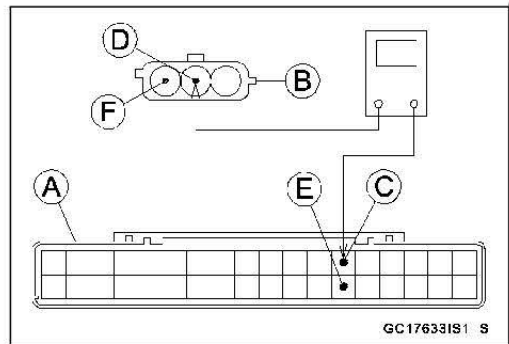
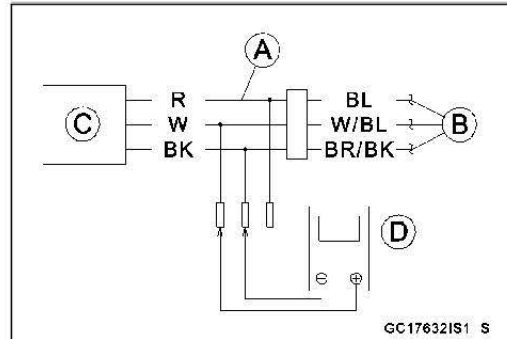
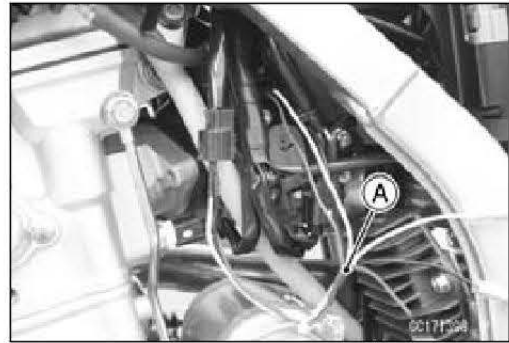
ECU Connector [A] ↔

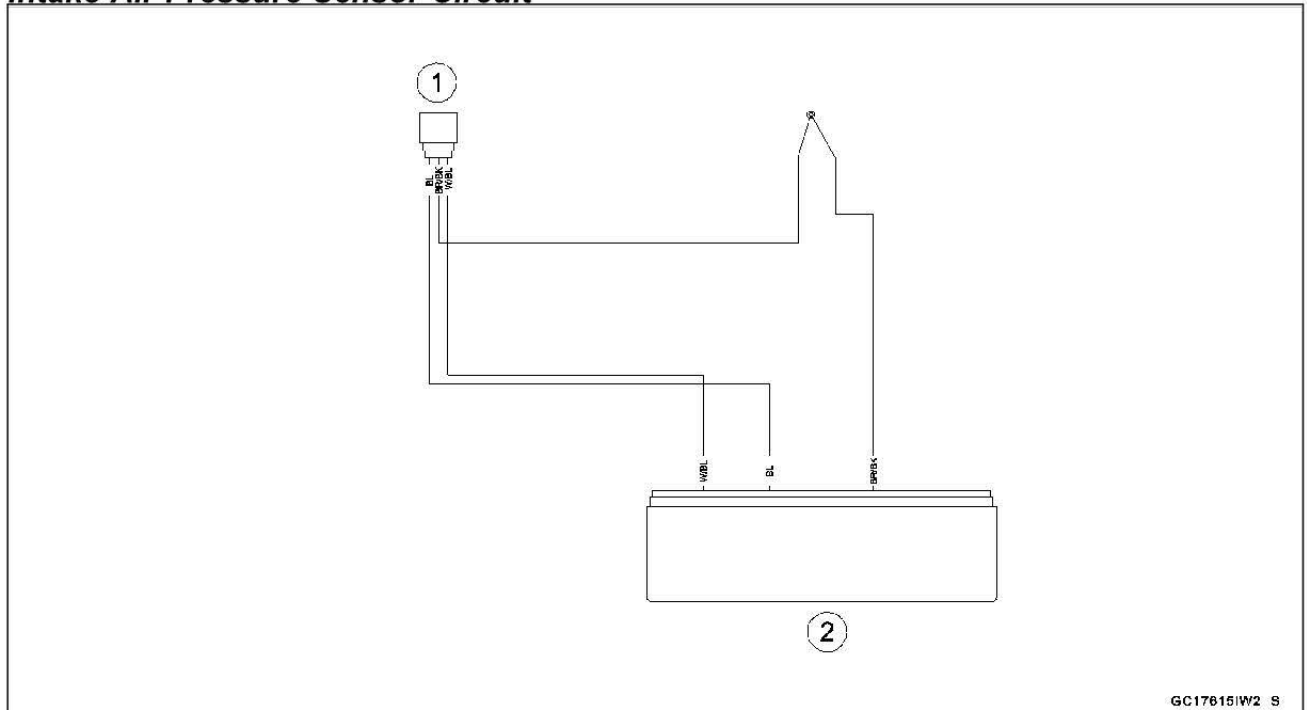
Intake Air Pressure Connector [B]

ECU Terminal 6 [C] ↔ Sensor Terminal [D]

ECU Terminal 24 [E] ↔ Sensor Terminal [F]

- ★ If the wiring is good, check the ECU for its ground and power supply (see ECU Power Supply Inspection(3-93)).
- ★ If the ground and power supply are good, replace the ECU.



Intake Air Pressure Sensor (Service Code 12)***Intake Air Pressure Sensor Circuit***

- 1. Intake Air Pressure Sensor
- 2. ECU

3-52 FUEL SYSTEM (DFI)

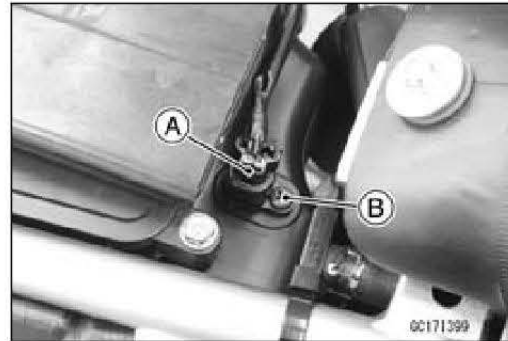
Intake Air Temperature Sensor (Service Code 13)

Intake Air Temperature Sensor Removal

NOTICE

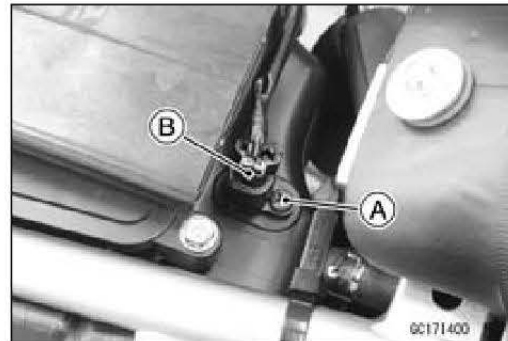
Never drop the intake air temperature sensor especially on a hard surface. Such a shock to the sensor can damage it.

- Remove the seat (see Seat Removal (15-7)).
- Disconnect:
Intake Air Temperature Sensor Connector [A]
- Remove:
Intake Air Temperature Sensor Screw [B]
Intake Air Temperature Sensor



Intake Air Temperature Sensor Installation

- Put the intake air temperature sensor into the air cleaner housing.
- When installing the sensor which is fastened by screw, tighten the screw after placing the sensor on the bottom surface completely.
- Tighten:
Torque - Intake Air Temperature Sensor Screw [A]: 1.2 N·m (0.12 kgf·m, 11 in·lb)
- Connect the intake air temperature sensor connector [B].



Intake Air Temperature Sensor Output Voltage Inspection

NOTE

○ Be sure the battery is fully charged.

- Turn the ignition switch off.
- Remove the seat (see Seat Removal (15-7)).
- Disconnect the intake air temperature sensor connector and connect the measuring adapter [A] between these connectors as shown.
Main Harness [B]
Intake Air Temperature Sensor [C]

Special Tool - Measuring Adapter: 57001-1700

- Connect a digital meter [D] to the measuring adapter leads.

Intake Air Temperature Sensor Output Voltage Connections to Adapter:

Digital Meter (+) → R (sensor P/BK) lead

Digital Meter (-) → BK (sensor BR/BK) lead

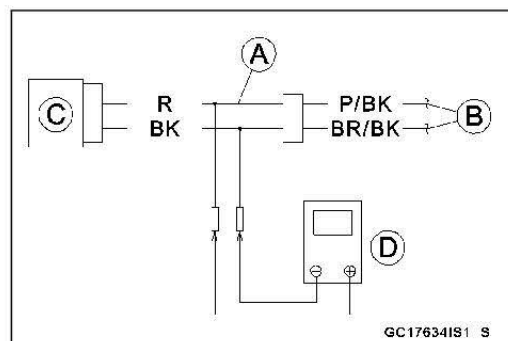
- Measure the output voltage with the engine stopped and the connector joined.
- Turn the ignition switch on.

Output Voltage

Standard: About DC 2.25 ~ 2.50 V @20°C (68°F)

NOTE

○ The output voltage changes according to the intake air temperature.



Intake Air Temperature Sensor (Service Code 13)

- Turn the ignition switch off.
- ★ If the reading is nearly standard, check the ECU for its ground and power supply (see [ECU Power Supply Inspection\(3-93\)](#)).
- ★ If the ground and power supply are good, replace the ECU.
- ★ If the reading is out of the standard, remove the ECU and check the wiring for continuity between main harness connectors.
- Disconnect the ECU and sensor connectors.

Wiring Inspection

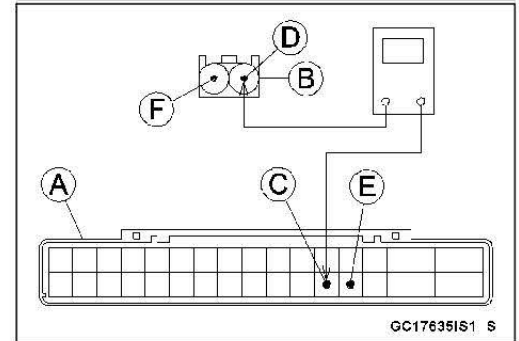
ECU Connector [A] ↔

Intake Air Temperature Sensor Connector [B]

ECU Terminal 25 [C] ↔ Sensor Terminal [D]

ECU Terminal 24 [E] ↔ Sensor Terminal [F]

- ★ If the wiring is good, check the intake air temperature sensor resistance (see [Intake Air Temperature Sensor Resistance Inspection\(3-53\)](#)).



Intake Air Temperature Sensor Resistance Inspection

- Remove the intake air temperature sensor (see [Intake Air Temperature Sensor Removal\(3-52\)](#)).
- Suspend the sensor [A] in a container of water so that the heat-sensitive portion is submerged.
- Suspend a thermometer [B] with the heat-sensitive portion [C] located in almost the same depth with the sensor.

NOTE

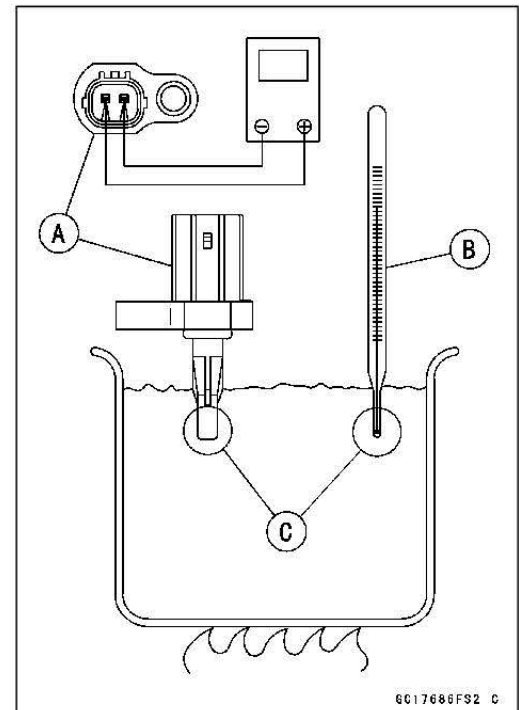
- The sensor and thermometer must not touch the container side or bottom.
- Place the container over a source of heat and gradually raise the temperature of the water while stirring the oil gently for even temperature.
- Using a digital meter, measure the internal resistance of the sensor across the terminals at the temperatures shown in the following.

Intake Air Temperature Sensor Resistance

Standard: 5.4 ~ 6.6 kΩ @0°C (32°F)

0.29 ~ 0.39 kΩ @80°C (176°F)

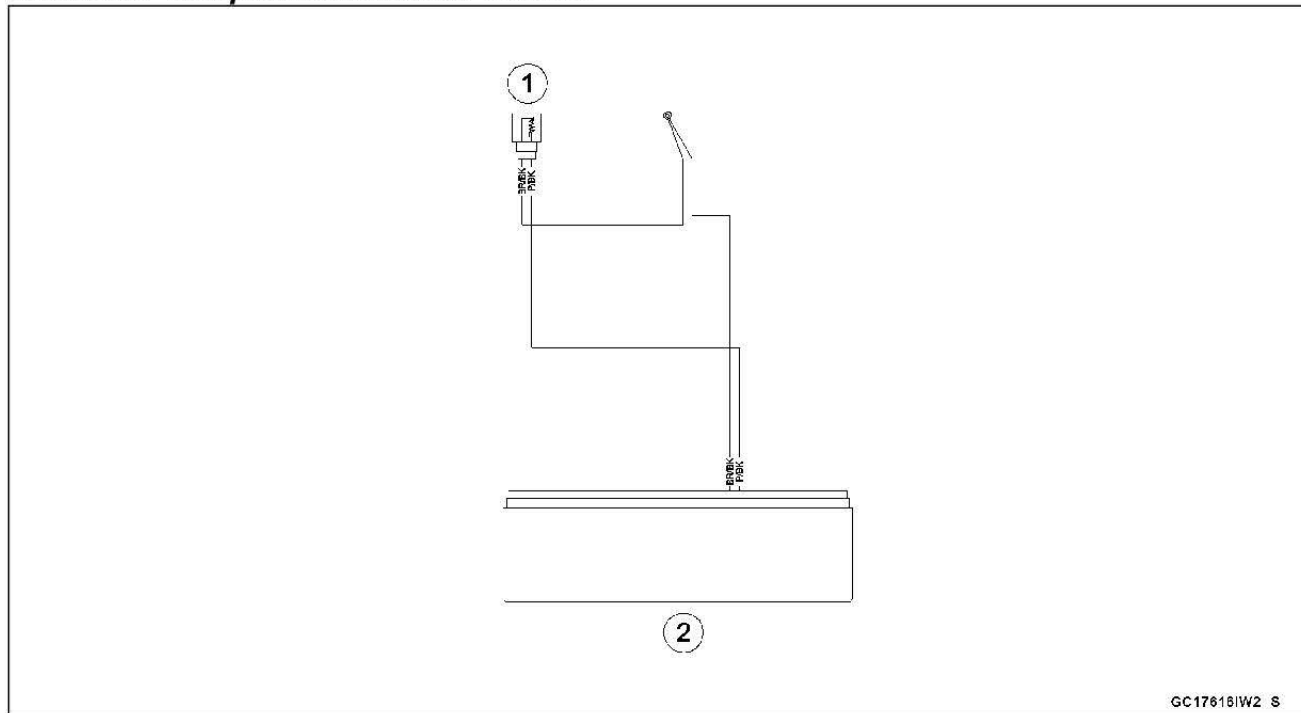
- ★ If the reading is out of the standard, replace the sensor.
- ★ If the reading is within the standard, but the problem still exists, replace the ECU.



3-54 FUEL SYSTEM (DFI)

Intake Air Temperature Sensor (Service Code 13)

Intake Air Temperature Sensor Circuit



1. Intake Air Temperature Sensor
2. ECU

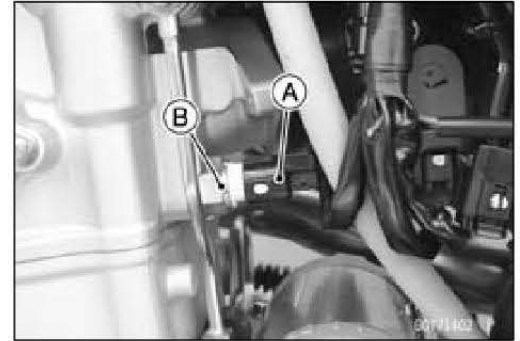
Water Temperature Sensor (Service Code 14)

Water Temperature Sensor Removal

NOTICE

Never drop the water temperature sensor especially on a hard surface. Such a shock to the sensor can damage it.

- Drain the coolant (see [Coolant Change\(2-25\)](#)).
- Disconnect:
Water Temperature Sensor Connector [A]
- Remove:
Water Temperature Sensor [B] with O-ring



Water Temperature Sensor Installation

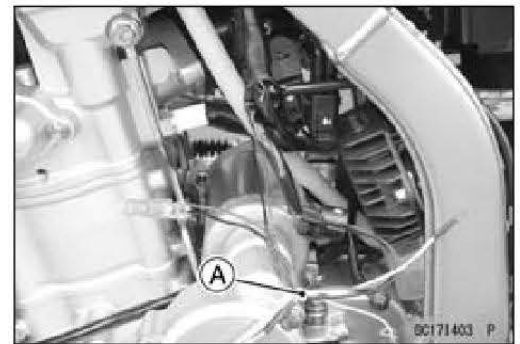
- Replace the O-ring with a new one.
- Tighten:
Torque - Water Temperature Sensor: 12 N·m (1.2 kgf·m, 106 in·lb)
- Fill the engine with coolant and bleed the air from the cooling system (see [Coolant Change\(2-25\)](#)).

Water Temperature Sensor Output Voltage Inspection

NOTE

○Be sure the battery is fully charged.

- Turn the ignition switch off.
- Disconnect the water temperature sensor connector and connect the measuring adapter [A] between these connectors as shown.
Main Harness [B]
Water Temperature Sensor [C]



Special Tool - Measuring Adapter: 57001-1700

- Connect a digital meter [D] to the measuring adapter leads.

Water Temperature Sensor Output Voltage

Connections to Adapter:

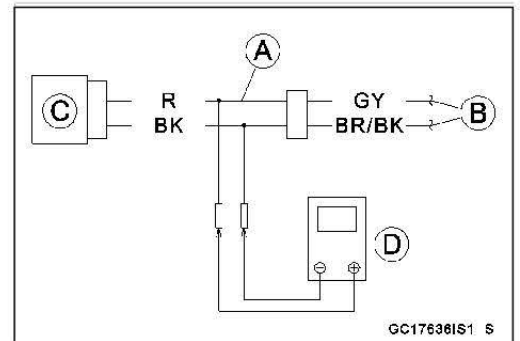
Digital Meter (+) → R (sensor GY) lead

Digital Meter (-) → BK (sensor BR/BK) lead

- Measure the output voltage with the engine stopped and with the connector joined.
- Turn the ignition switch on.

Output Voltage

Standard: About DC 2.80 ~ 2.97 V @20°C (68°F)



NOTE

○The output voltage changes according to the coolant temperature in the engine.

- Turn the ignition switch off.
- ★ If the reading is within the standard, check the ECU for its ground and power supply (see [ECU Power Supply Inspection\(3-93\)](#)).
- ★ If the ground and power supply are good, replace the ECU.

3-56 FUEL SYSTEM (DFI)

Water Temperature Sensor (Service Code 14)

- ★ If the reading is out of the standard, remove the ECU and check the wiring for continuity between main harness connectors.

○ Disconnect the ECU and sensor connectors.

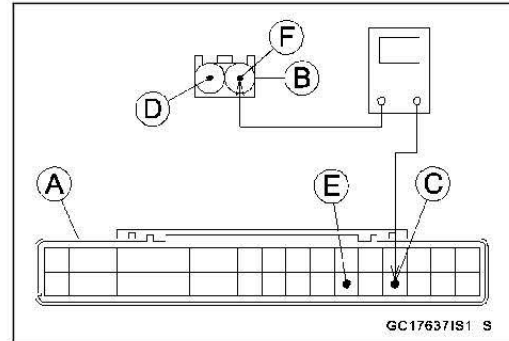
Wiring Continuity Inspection

ECU Connector [A] ↔

Water Temperature Sensor Connector [B]

ECU Terminal 22 [C] ↔ Sensor Terminal [D]

ECU Terminal 24 [E] ↔ Sensor Terminal [F]

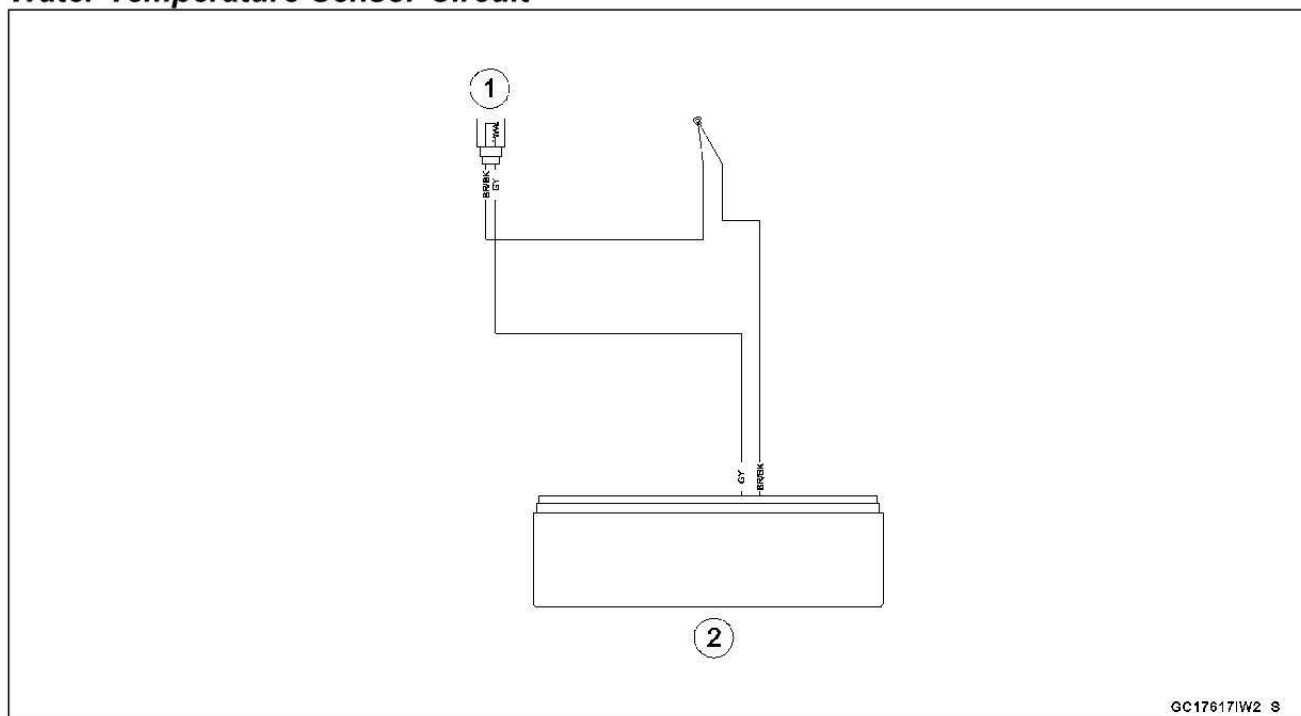


- ★ If the wiring is good, check the water temperature sensor resistance (see [Water Temperature Sensor Resistance Inspection\(3-56\)](#)).

Water Temperature Sensor Resistance Inspection

- Refer to the [Water Temperature Sensor Inspection\(16-75\)](#).
- ★ If the reading is within the standard, but the problem still exists, replace the ECU.

Water Temperature Sensor Circuit



1. Water Temperature Sensor
2. ECU

Crankshaft Sensor (Service Code 21)

The crankshaft sensor has no power source, and when the engine stops, the crankshaft sensor generates no signals.

Crankshaft Sensor Removal

- Refer to the Crankshaft Sensor Removal (see Crankshaft Sensor Removal(16-35)).

Crankshaft Sensor Installation

- Refer to the Crankshaft Sensor Installation (see Crankshaft Sensor Installation(16-36)).

Crankshaft Sensor Resistance Inspection

- Refer to the Crankshaft Sensor Inspection (see Crankshaft Sensor Inspection(16-36)).
- ★ If the reading is within the standard, check the peak voltage (see Crankshaft Sensor Peak Voltage Inspection(3-57)).

Crankshaft Sensor Peak Voltage Inspection

- Refer to the Crankshaft Sensor Peak Voltage Inspection (see Crankshaft Sensor Peak Voltage Inspection(16-36)).
- ★ If the reading is within the standard, remove the ECU and check the wiring for continuity between main harness connectors.
- Disconnect the ECU and sensor connectors.

Wiring Continuity Inspection

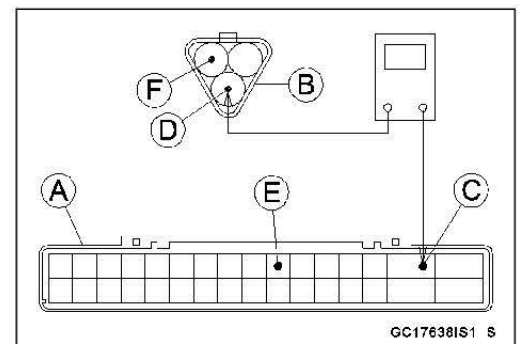
ECU Connector [A] ↔

Crankshaft Sensor Connector [B]

ECU Terminal 3 [C] ↔ Sensor Terminal [D]

ECU Terminal 9 [E] ↔ Sensor Terminal [F]

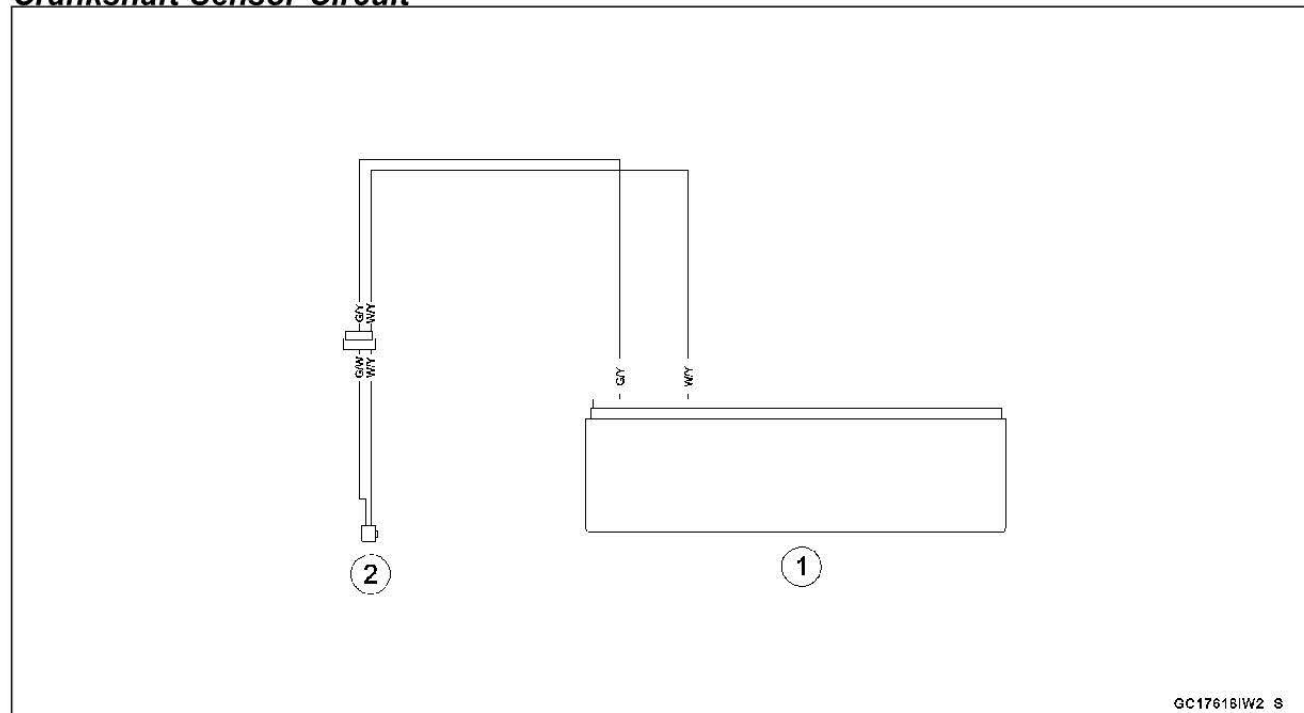
- ★ If the wiring is good, check the ECU for its ground and power supply (see ECU Power Supply Inspection(3-93)).
- ★ If the ground and power supply are good, replace the ECU.



3-58 FUEL SYSTEM (DFI)

Crankshaft Sensor (Service Code 21)

Crankshaft Sensor Circuit



- 1. ECU
- 2. Crankshaft Sensor

Speed Sensor (Service Code 24)

Speed Sensor Removal

- Refer to the Speed Sensor Removal ([see Speed Sensor Removal\(16-75\)](#)).

Speed Sensor Installation

- Refer to the Speed Sensor Installation ([see Speed Sensor Installation\(16-76\)](#)).

Speed Sensor Input Voltage Inspection

NOTE

○Be sure the battery is fully charged.

- Turn the ignition switch off.
- Remove the Headlight/Meter Cover ([see Headlight Removal\(16-52\)](#)).
- Disconnect the speed sensor connector [A].



- Connect the throttle sensor setting adapter #1 [A] between these connectors.

Special Tool - Throttle Sensor Setting Adapter #1: 57001-1400

- Connect a digital meter to the throttle sensor setting adapter #1 leads.

Speed Sensor Input Voltage

Connections to Adapter:

Digital Meter (+) → Y/W (sensor O/R) lead

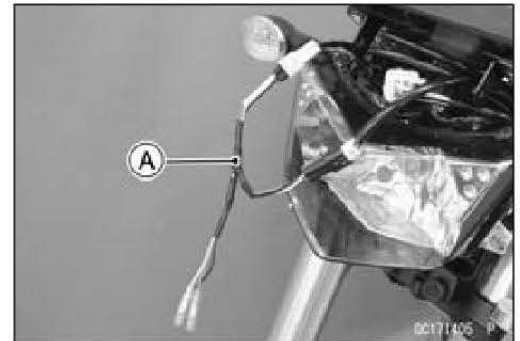
Digital Meter (–) → BK/BL (sensor BK/W) lead

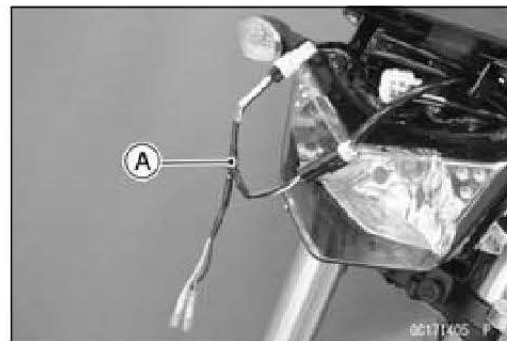
- Measure the input voltage with the engine stopped and with the connector joined.
- Turn the ignition switch on.

Input Voltage

Standard: About DC 9 ~ 11 V

- Turn the ignition switch off.
- ★ If the reading is within the standard, check the output voltage ([see Speed Sensor Output Voltage Inspection\(3-60\)](#)).
- ★ If the reading is out of the standard, check the speed sensor power supply voltage ([see Meter Unit Inspection\(16-66\)](#)).





Speed Sensor (Service Code 24)

★ If the reading is within the standard, remove the ECU and check the wiring for continuity between main harness connectors.

○ Disconnect the ECU and sensor connectors.

Wiring Inspection

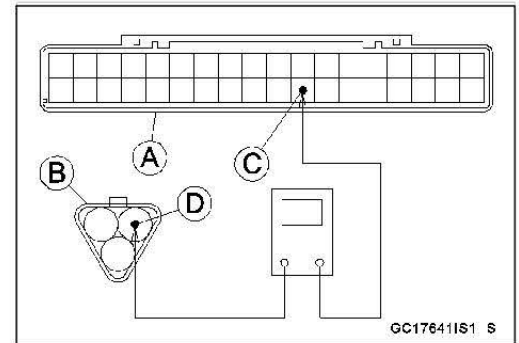
ECU Connector [A] ↔

Speed Sensor Connector [B]

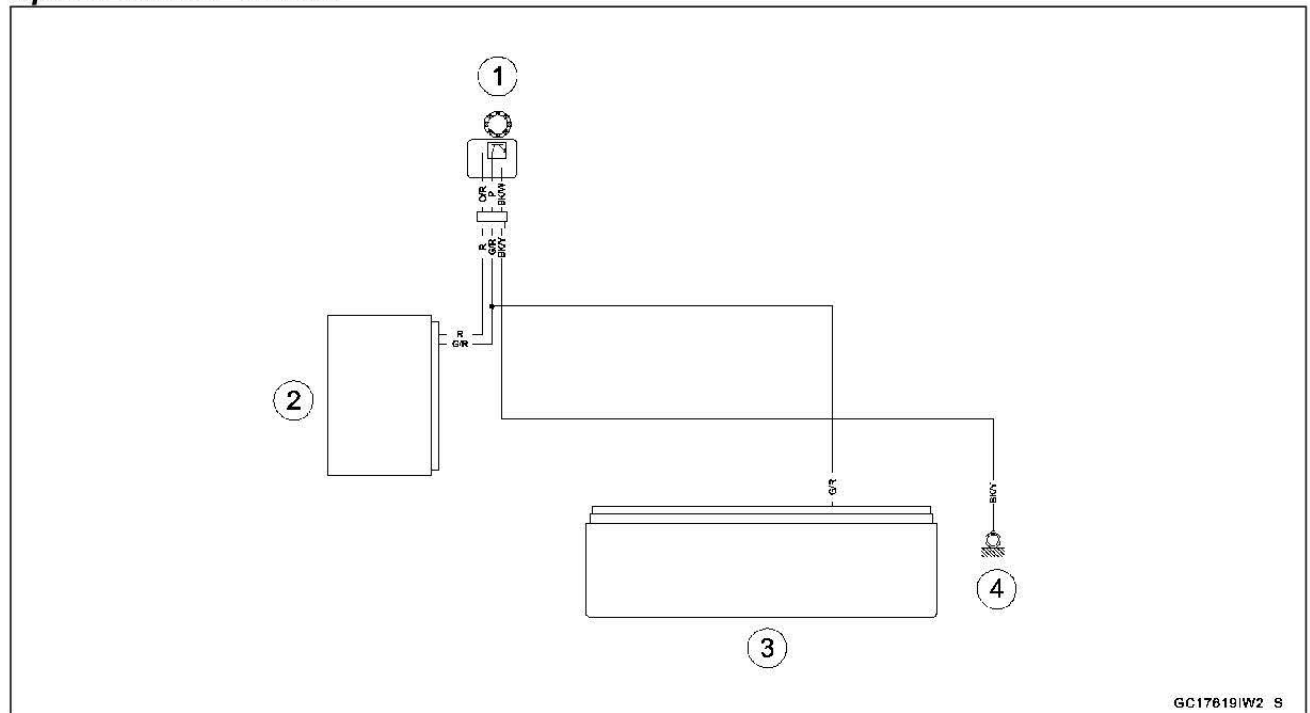
ECU terminal 26 [C] ↔ Sensor Terminal [D]

★ If the wiring is good, check the ECU for its ground and power supply (see ECU Power Supply Inspection(3-93)).

★ If the ground and power supply are good, replace the ECU.



Speed Sensor Circuit



1. Speed Sensor
2. Meter Unit
3. ECU
4. Frame Ground

3-62 FUEL SYSTEM (DFI)

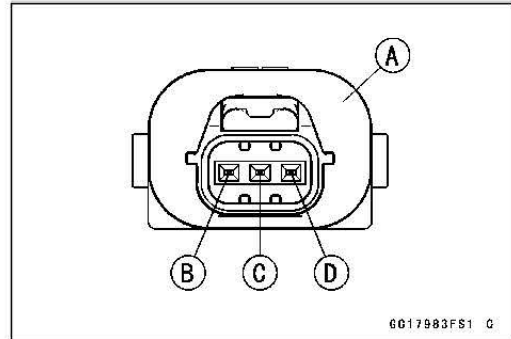
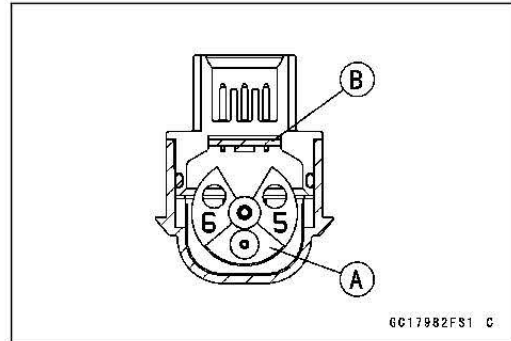
Vehicle-down Sensor (Service Code 31)

This sensor has a weight [A] with two magnets inside, and sends a signal to the ECU. But when the motorcycle banks 60 ~ 70° or more to either side (in fact falls down), the weight turns and the signal changes. The ECU senses this change, and stops the fuel system and ignition system.

Hall IC [B]

When the motorcycle is down, the ignition switch is left on. If the starter button is pushed, the electric starter turns but the engine does not start. To start the engine again, raise the motorcycle, turn the ignition switch off, and then turn it on.

Vehicle-down Sensor [A]
Ground Terminal [B]: BR/BK
Output Terminal [C]: Y/G
Input Terminal [D]: BL

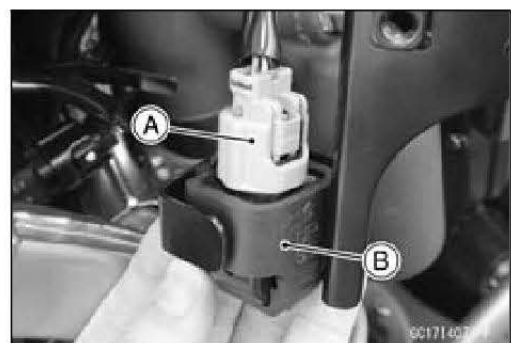
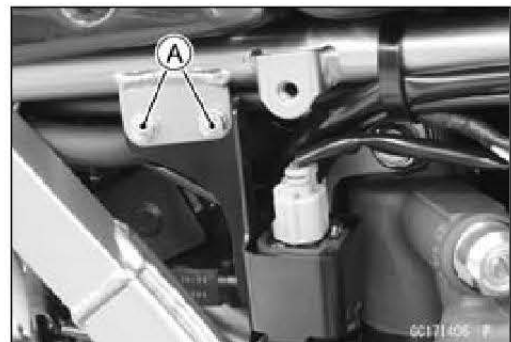


Vehicle-down Sensor Removal

NOTICE

Never drop the vehicle-down sensor especially on a hard surface. Such a shock to the sensor can damage it.

- Remove:
 - Left Side Cover (see Side Cover Removal(15-8))
 - Vehicle-down Sensor Bracket Bolts [A]
- Disconnect:
 - Vehicle-down Sensor Connector [A]
- Remove the vehicle-down sensor [B] from the bracket.



Vehicle-down Sensor (Service Code 31)

Vehicle-down Sensor Installation

- Installation is the reverse of removal.
- The UP mark [A] of the sensor should face upward.

WARNING

Incorrect installation of the vehicle-down sensor could cause sudden loss of engine power. The rider could lose balance during certain riding situations for an accident resulting in injury or death. Ensure that the vehicle-down sensor is held in place by the sensor bracket.

- Tighten:
Torque - Vehicle-down Sensor Bracket Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)
- Install the removed parts.

Vehicle-down Sensor Input Voltage Inspection

NOTE

○Be sure the battery is fully charged.

- Turn the ignition switch off.
- Remove the vehicle-down sensor (see Vehicle-down Sensor Removal(3-62))
- Connect the measuring adapter [A] between these connectors as shown.
Main Harness [B]
Vehicle-down Sensor [C]
- **Special Tool - Measuring Adapter: 57001-1700**
- Connect a digital meter [D] to the measuring adapter leads.

Vehicle-down Sensor Input Voltage

Connections to Adapter:

Digital Meter (+) → R (sensor BL) lead

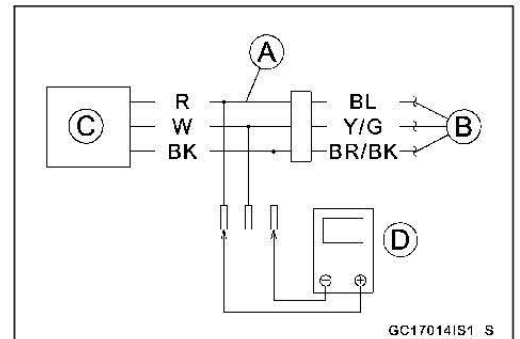
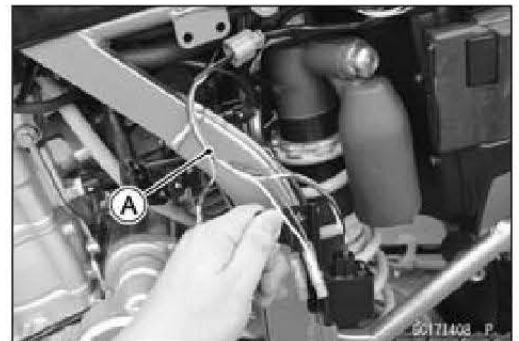
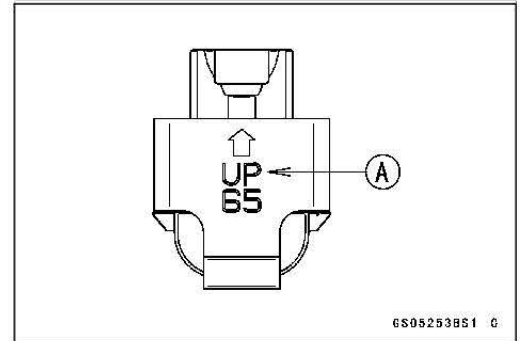
Digital Meter (–) → BK (sensor BR/BK) lead

- Measure the input voltage with the engine stopped and with the connector joined.
- Turn the ignition switch on.

Input Voltage

Standard: DC 4.75 ~ 5.25 V

- Turn the ignition switch off.
- ★ If the reading is within the standard, check the output voltage (see Vehicle-down Sensor Output Voltage Inspection(3-64)).



3-64 FUEL SYSTEM (DFI)

Vehicle-down Sensor (Service Code 31)

- ★ If the reading is out of the standard, remove the ECU and check the wiring for continuity between main harness connectors.

○ Disconnect the ECU and sensor connectors.

Wiring Continuity Inspection

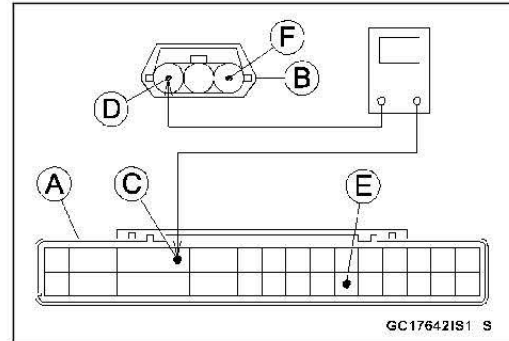
ECU Connector [A] ↔

Vehicle-down Sensor Connector [B]

ECU Terminal 13 [C] ↔ Sensor Terminal [D]

ECU Terminal 24 [E] ↔ Sensor Terminal [F]

- ★ If the wiring is good, check the ECU for its ground and power supply (see ECU Power Supply Inspection(3-93)).
- ★ If the ground and power supply are good, replace the ECU.



Vehicle-down Sensor Output Voltage Inspection

- Measure the output voltage at the vehicle-down sensor in the same way as input voltage inspection, note the following.

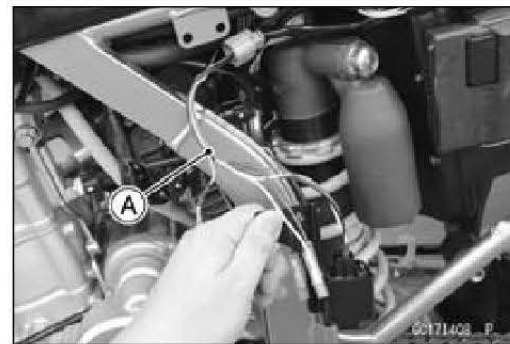
○ Connect the measuring adapter [A] to the vehicle-down sensor connectors as shown.

Main Harness [B]

Vehicle-down Sensor [C]

Special Tool - Measuring Adapter: 57001-1700

- Connect a digital meter [D] to the measuring adapter leads.

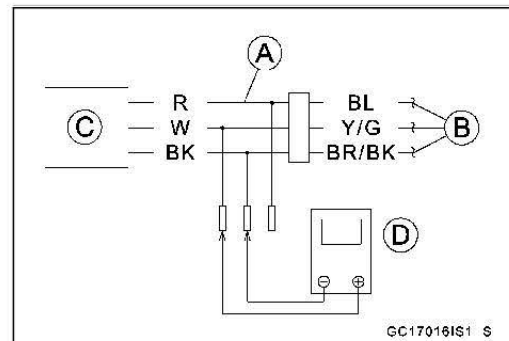


Vehicle-down Sensor Output Voltage

Connections to Adapter:

Digital Meter (+) → W (sensor Y/G) lead

Digital Meter (-) → BK (sensor BR/BK) lead



Vehicle-down Sensor (Service Code 31)

- Hold the sensor vertically.
- Measure the output voltage with the engine stopped and with the connector joined.
- Turn the ignition switch on.
- Tilt the sensor 60 ~ 70° or more [A] right or left, then hold the sensor almost vertical with the arrow mark pointed up [B], and measure the output voltage.

Output Voltage

Standard: With sensor tilted 60 ~ 70° or more right or left: DC 0.65 ~ 1.35 V

With sensor arrow mark pointed up: DC 3.55 ~ 4.45 V

- Turn the ignition switch off.
- ★ If the reading is out of the standard, replace the sensor.

- ★ If the reading is within the standard, remove the ECU and check the wiring for continuity between main harness connectors.

○ Disconnect the ECU and sensor connectors.

Wiring Continuity Inspection

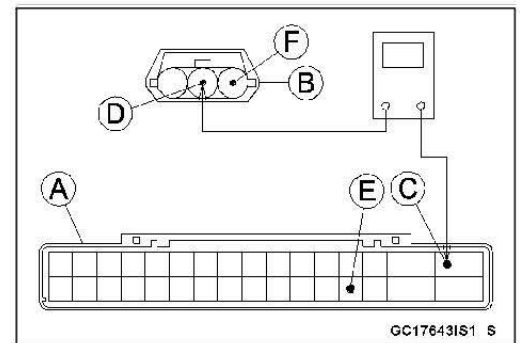
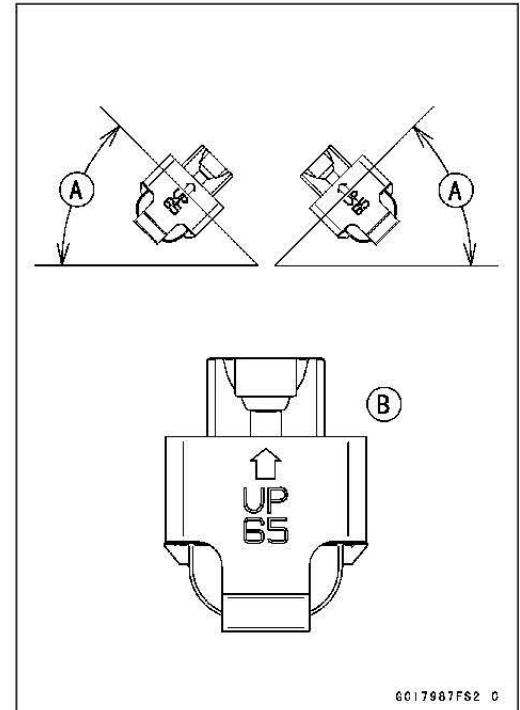
ECU Connector [A] ↔

Vehicle-down Sensor Connector [B]

ECU Terminal 2 [C] ↔ Sensor Terminal [D]

ECU Terminal 24 [E] ↔ Sensor Terminal [F]

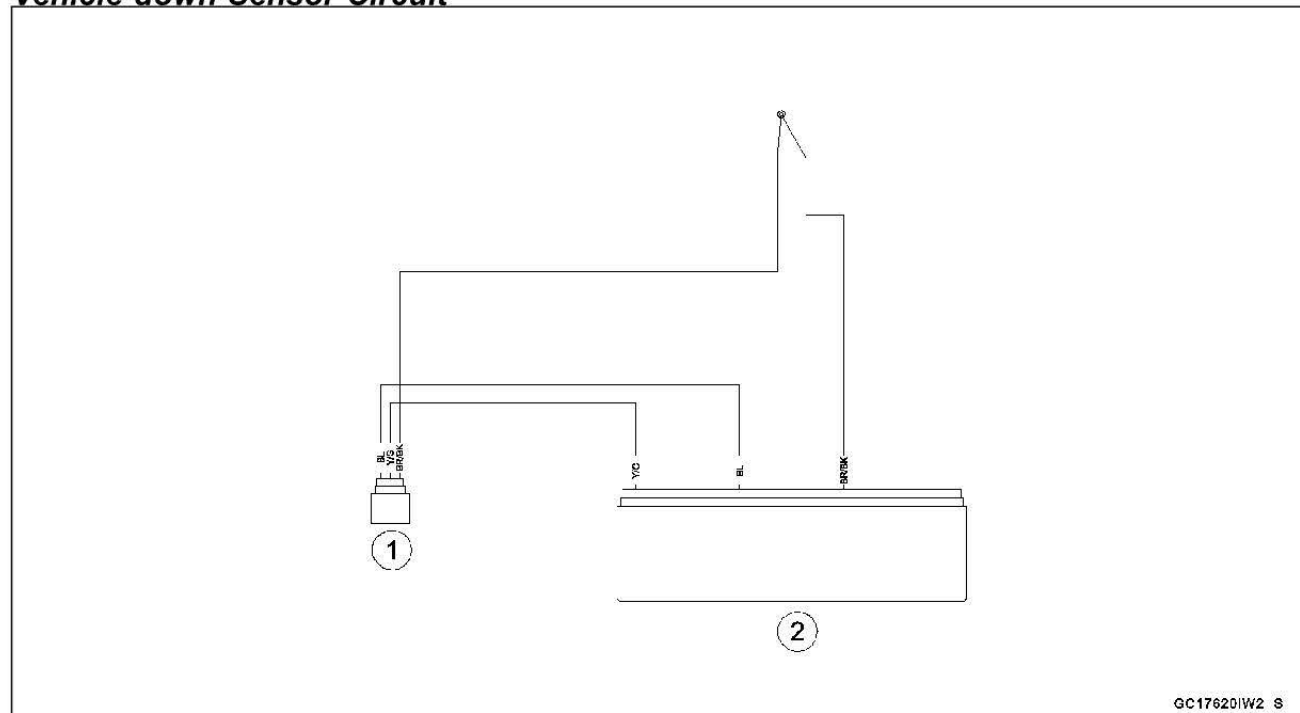
- ★ If the wiring is good, check the ECU for its ground and power supply (see ECU Power Supply Inspection(3-93)).
- ★ If the ground and power supply are good, replace the ECU.



3-66 FUEL SYSTEM (DFI)

Vehicle-down Sensor (Service Code 31)

Vehicle-down Sensor Circuit



1. Vehicle-down Sensor
2. ECU

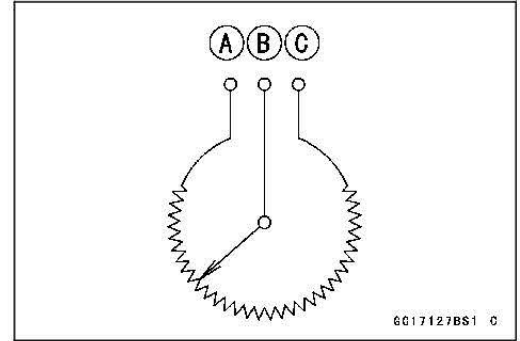
Subthrottle Sensor (Service Code 32)

The subthrottle sensor is a rotating variable resistor that change output voltage according to throttle operating. The ECU senses this voltage change and determines fuel injection quantity, and ignition timing according to engine rpm, and throttle opening.

Input Terminal [A]

Output Terminal [B]

Ground Terminal [C]



Subthrottle Sensor Removal/Adjustment

NOTICE

Do not remove or adjust the subthrottle sensor [A] since it has been adjusted and set with precision at the factory.

Never drop the throttle body assy especially on a hard surface. Such a shock to the subthrottle sensor can damage it.



Subthrottle Sensor Input Voltage Inspection

NOTE

○Be sure the battery is fully charged.

- Turn the ignition switch off.
- Remove:
Vehicle-down Sensor Bracket (see Vehicle-down Sensor Removal(3-62))
- Disconnect the subthrottle sensor and connect the throttle sensor setting adapter [A] between these connectors.

Special Tool - Throttle Sensor Setting Adapter: 57001-1538

- Connect a digital meter to the throttle sensor setting adapter leads.

Subthrottle Sensor Input Voltage

Connections to Adapter:

Digital Meter (+) → BK (sensor BL) lead

Digital Meter (-) → W (sensor BR/BK) lead

- Measure the input voltage with the engine stopped and with the connector joined.
- Turn the ignition switch on.

Input Voltage

Standard: DC 4.75 ~ 5.25 V

- Turn the ignition switch off.
- ★ If the reading is within the standard, check the output voltage (see Subthrottle Sensor Output Voltage Inspection(3-68)).



3-68 FUEL SYSTEM (DFI)

Subthrottle Sensor (Service Code 32)

- ★ If the reading is out of the standard, remove the ECU and check the wiring for continuity between main harness connectors.

○ Disconnect the ECU and sensor connectors.

Wiring Inspection

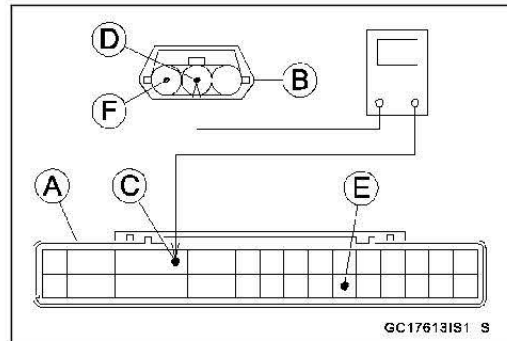
ECU Connector [A] ↔

Subthrottle Sensor Connector [B]

ECU terminal 13 [C] ↔ Sensor Terminal [D]

ECU terminal 24 [E] ↔ Sensor Terminal [F]

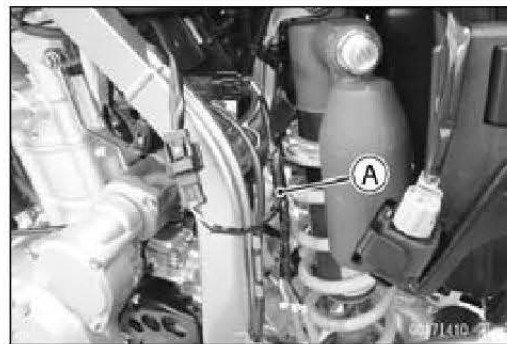
- ★ If the wiring is good, check the ECU for its ground and power supply (see ECU Power Supply Inspection(3-93)).
- ★ If the ground and power supply are good, replace the ECU.



Subthrottle Sensor Output Voltage Inspection

- Measure the output voltage at the subthrottle sensor in the same way as input voltage inspection, note the following.
- Disconnect the subthrottle sensor connector and connect the throttle sensor setting adapter [A] between these connectors.

Special Tool - Throttle Sensor Setting Adapter: 57001-1538



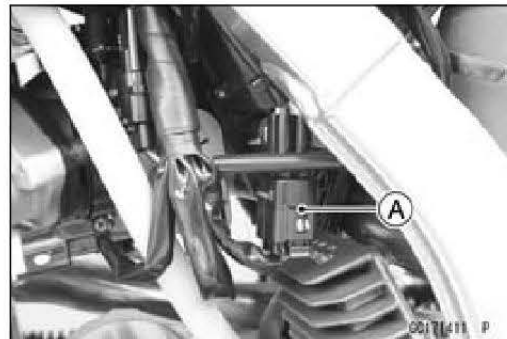
Subthrottle Sensor Output Voltage

Connections to Adapter:

Digital Meter (+) → R (sensor BR/R) lead

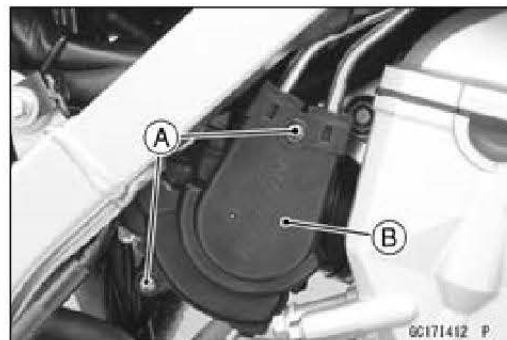
Digital Meter (-) → W (sensor BR/BK) lead

- Disconnect the subthrottle valve actuator harness connector [A].



KLX300D Model

- Remove:
 - Throttle Pulley Cover Screws [A]
 - Throttle Pulley Cover [B]



Subthrottle Sensor (Service Code 32)

- Measure the output voltage with the engine stopped with the connector joined.
- Turn the ignition switch on.
- Measure the output voltage when the subthrottle valve is completely closed by turning the lever [A] fully clockwise with a suitable tool.

Output Voltage

Standard: DC 0.48 ~ 0.52 V at subthrottle valve full close position

DC 3.60 ~ 3.80 V at subthrottle valve full open position (for reference)

NOTE

- Turn the lever counterclockwise, confirm the output voltage will be raise.
- The standard voltage refers to the value when the voltage reading at the Input Voltage Inspection shows 5 V exactly.
- When the input voltage reading shows other than 5 V, derive a voltage range as follows.

Example:

In the case of a input voltage of 4.75 V.

$$0.48 \times 4.75 \div 5.00 = 0.46 \text{ V}$$

$$0.52 \times 4.75 \div 5.00 = 0.49 \text{ V}$$

Thus, the valid range is 0.46 ~ 0.49 V

- Turn the ignition switch off.
- ★ If the reading is out of the standard, check the subthrottle sensor resistance (see Subthrottle Sensor Resistance Inspection(3-70)).
- ★ If the reading is within the standard, remove the ECU and check the wiring for continuity between main harness connectors.
- Disconnect the ECU and sensor connectors.

Wiring Inspection

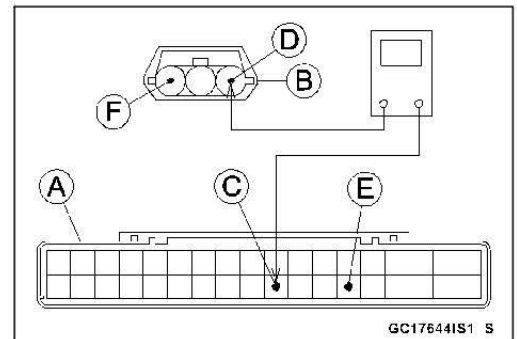
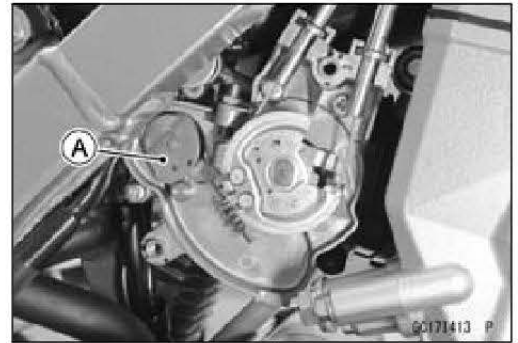
ECU Connector [A] ↔

Subthrottle Sensor Connector [B]

ECU terminal 27 [C] ↔ Sensor Terminal [D]

ECU terminal 24 [E] ↔ Sensor Terminal [F]

- ★ If the wiring is good, check the ECU for its ground and power supply (see ECU Power Supply Inspection(3-93)).
- ★ If the ground and power supply are good, replace the ECU.



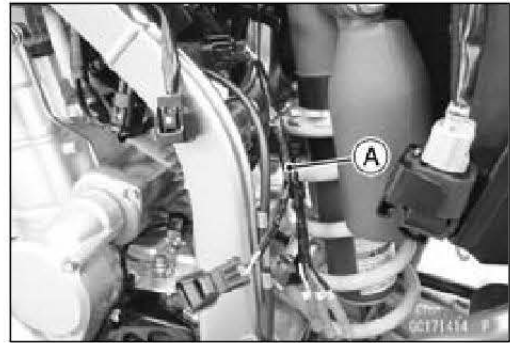
3-70 FUEL SYSTEM (DFI)

Subthrottle Sensor (Service Code 32)

Subthrottle Sensor Resistance Inspection

- Disconnect the subthrottle sensor connector.
- Connect a throttle sensor setting adapter [A] to the subthrottle sensor.
- Measure the subthrottle sensor resistance.

Special Tool - Throttle Sensor Setting Adapter: 57001-1538



Subthrottle Sensor Resistance

Connections to Adapter:

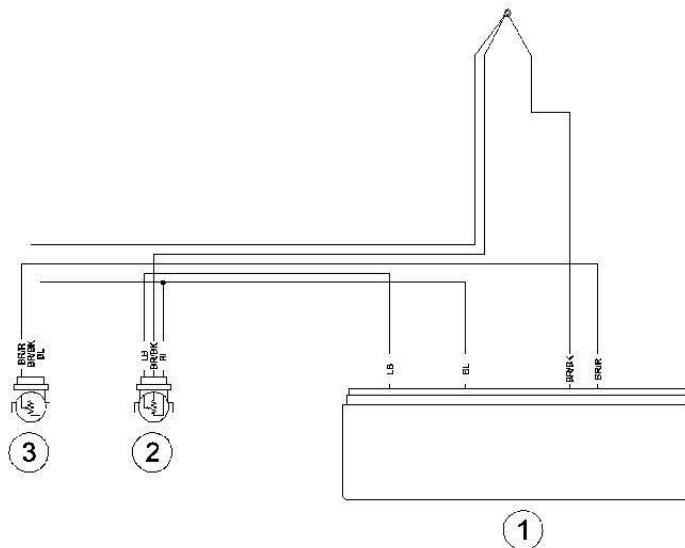
Digital Meter (+) → BK (sensor BL) lead

Digital Meter (-) → W (sensor BR/BK) lead

Standard: 4 ~ 6 kΩ

- ★ If the reading is out of the standard, replace the throttle body assy.
- ★ If the reading is within the standard, but the problem still exists, replace the ECU.

Subthrottle Sensor Circuit



GC17B14/W2 S

1. ECU
2. Main Throttle Sensor
3. Subthrottle Sensor

Oxygen Sensor - not activated (Service Code 33)

Oxygen Sensor Removal

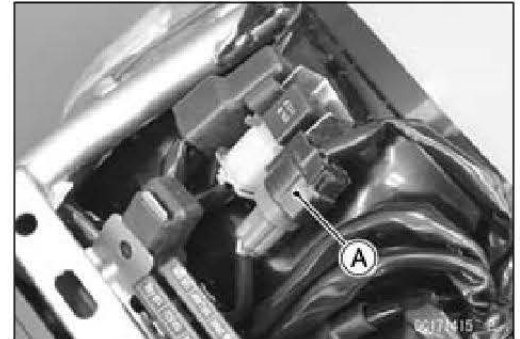
- Refer to the Oxygen Sensor Removal (see Oxygen Sensor Removal(16-77)).

Oxygen Sensor Installation

- Refer to the Oxygen Sensor Installation (see Oxygen Sensor Installation(16-78)).

Oxygen Sensor Inspection

- Warm up the engine thoroughly until the radiator fan starts.
- Turn the ignition switch off.
- Remove:
Seat (see Seat Removal (15-7))
- Remove the oxygen sensor lead connector [A] from the bracket.



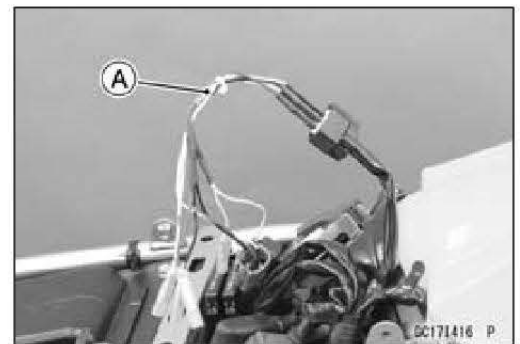
- Disconnect the oxygen sensor lead connector and connect the measuring adapter [A] between these connectors.

Main Harness [B]

Oxygen Sensor [C]

Special Tool - Measuring Adapter: 57001-1700

- Connect a digital meter [D] to the measuring adapter leads.

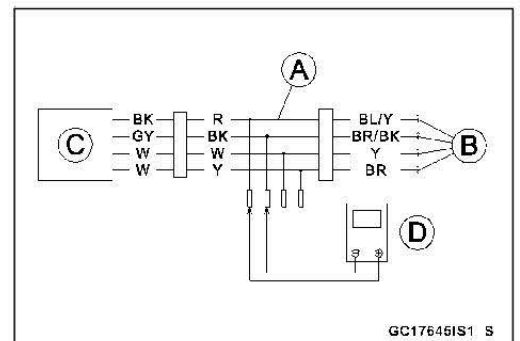


Oxygen Sensor Output Voltage

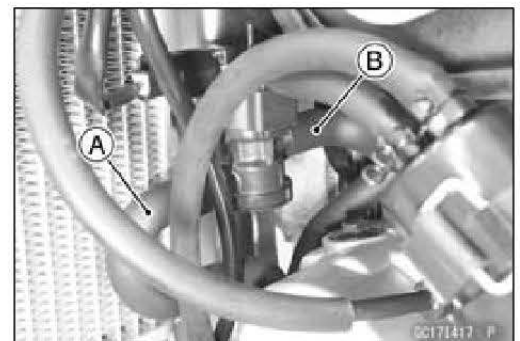
Connections to Adapter:

Digital Meter (+) → R (sensor BK) lead

Digital Meter (-) → BK (sensor GY) lead



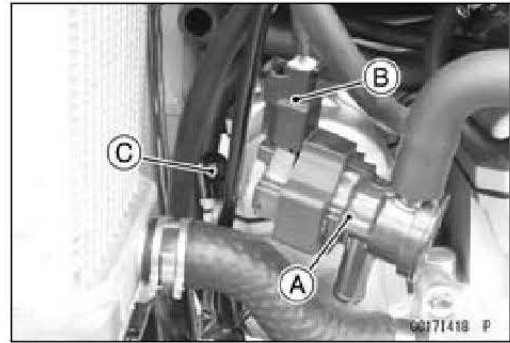
- Remove:
Left Shroud (see Shroud Removal(15-10))
- Disconnect the hose [A] from the air suction valve cover.
- Disconnect the hose [B] from the air switching valve.



3-72 FUEL SYSTEM (DFI)

Oxygen Sensor - not activated (Service Code 33)

- Pull the air switching valve [A] from frame bracket.
- Do not disconnect the air switching valve connector [B].
- Install the suitable plug [C] on the fitting of the air suction valve cover, and shut off the secondary air.



- Start the engine, and let it idle.
- Measure the output voltage with the connector joined.

Output Voltage (with Plug)

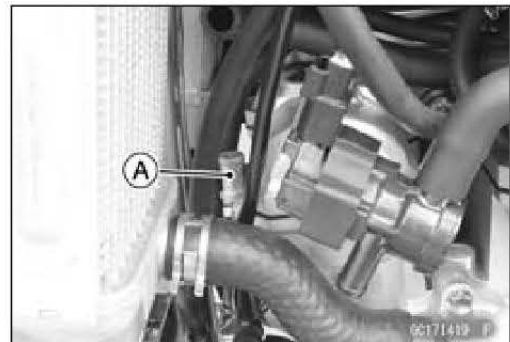
Standard: DC 0.8 V or more

- Next, remove the plug from the fitting [A] with idling.
- Measure the output voltage with the connector joined.

Output Voltage (without Plug)

Standard: DC 0.24 V or less

- Turn the ignition switch off.



- ★ If the reading is out of the standard (with plugs: DC 0.8 V or more, without plugs: DC 0.24 V or less), remove the ECU and check the wiring for continuity between main harness connectors.

- Disconnect the ECU and sensor connectors.

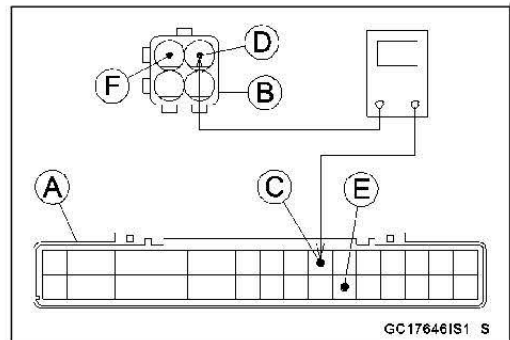
Wiring Inspection

ECU Connectors [A] ↔

Oxygen Sensor Connector [B]

ECU terminal 7 [C] ↔ Sensor Terminal [D]

ECU terminal 24 [E] ↔ Sensor Terminal [F]



- ★ If the wiring is good, replace the sensor.
- ★ If the reading is within the standard (with plugs: DC 0.8 V or more, without plugs: DC 0.24 V or less), check the ECU for its ground and power supply (see [ECU Power Supply Inspection\(3-93\)](#)).
- ★ If the ground and power supply are good, replace the ECU.

3-74 FUEL SYSTEM (DFI)

Fuel Injector (Service Code 41)

Fuel Injector Removal

- Remove:
 - Fuel Tank (see Fuel Tank Removal(3-113))
 - Fuel Hose (see Fuel Hose Replacement(2-22))
- Disconnect the fuel injector connector [A].
- Remove:
 - Delivery Pipe Screw [B]
 - Delivery Pipe [C] with Fuel Injector [D]

NOTE

○Do not damage the insertion portion of the fuel injector when it is pulled out from the throttle body assy.

- Remove the fuel injector [A] from the delivery pipe [B].

NOTE

○Do not damage the insertion portion of the fuel injector when it is pulled out from the delivery pipe.

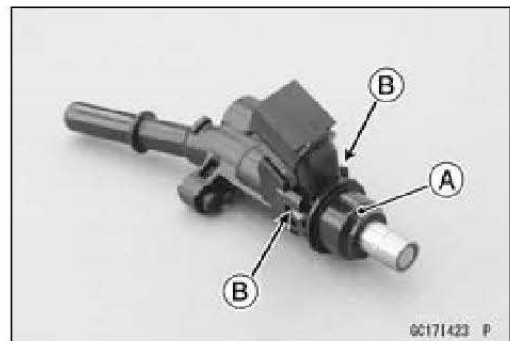
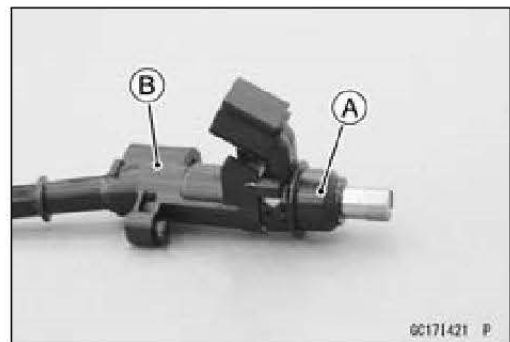
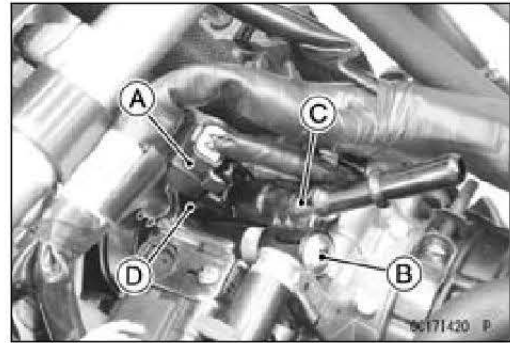
NOTICE

Never drop the fuel injector especially on a hard surface. Such a shock to the fuel injector can damage it.

Fuel Injector Installation

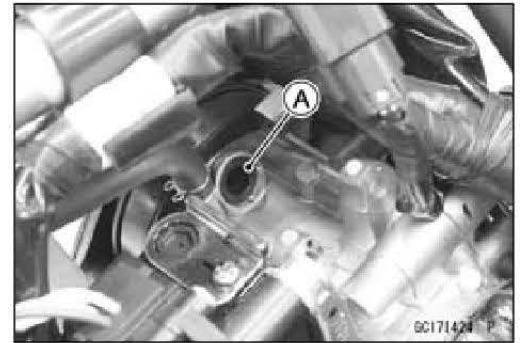
- Replace the O-ring [A] of the fuel injector with a new one.
- Apply engine oil to the new O-ring.

- Fit the fuel injector [A] between the projections [B] on the delivery pipe.

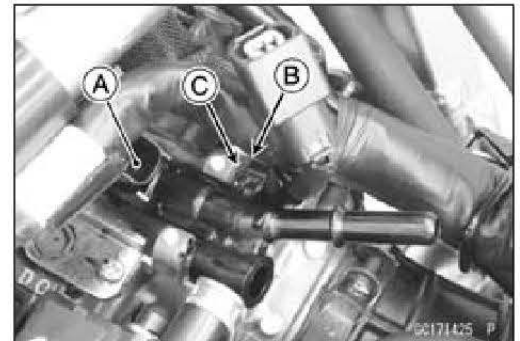


Fuel Injector (Service Code 41)

- Replace the dust seal [A] with a new one.
- Apply engine oil to the new dust seal.



- Install the fuel injector [A] and the delivery pipe.
- Fit the projection [B] of the delivery pipe to the hole [C] of the throttle body.
- Tighten:
 - Torque - Delivery Pipe Screw: 3.4 N·m (0.35 kgf·m, 30 in·lb)**
- Connect the fuel injector connector.
- Install the removed parts.

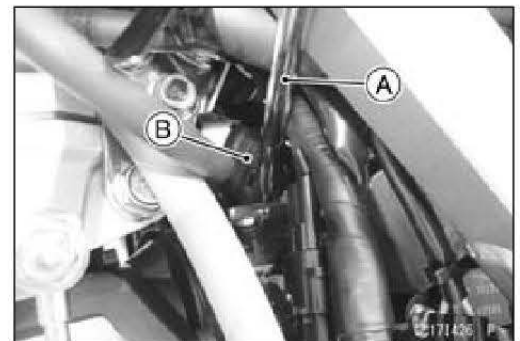


Fuel Injector Audible Inspection

NOTE

○ Be sure the battery is fully charged.

- Start the engine, and let it idle.
- Apply the flat tip screwdriver [A] to the fuel injector [B]. Put the grip end onto your ear, and listen whether the fuel injector is clicking or not.
- A sound scope can also be used.
- The click interval becomes shorter as the engine speed rises.
- ★ If the fuel injector click at a regular intervals, the fuel injector is normal.
- Turn the ignition switch off.
- ★ If the fuel injector does not click, check the fuel injector resistance (see Fuel Injector Resistance Inspection(3-75)).



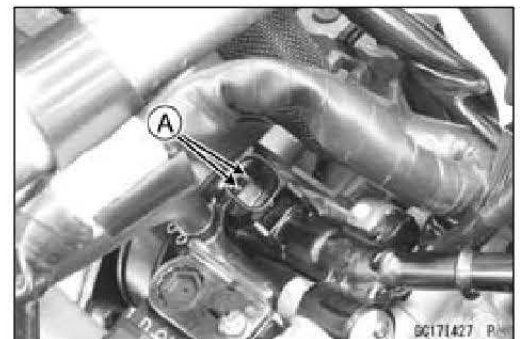
Fuel Injector Resistance Inspection

- Remove the fuel tank (see Fuel Tank Removal(3-113)).
- Disconnect the fuel injector connector.
- Connect a digital meter to the terminals [A] of the fuel injector.
- Measure the fuel injector resistance.

Fuel Injector Resistance

Standard: About 9.97 ~ 11.03 Ω @20°C (68°F)

- ★ If the reading is out of the standard, replace the fuel injector.
- ★ If the reading is within the standard, check the power source voltage (see Fuel Injector Power Source Voltage Inspection(3-76)).



3-76 FUEL SYSTEM (DFI)

Fuel Injector (Service Code 41)

Fuel Injector Power Source Voltage Inspection

NOTE

○Be sure the battery is fully charged.

- Remove the fuel tank (see Fuel Tank Removal(3-113)).
- Turn the ignition switch off.
- Disconnect the fuel injector connector and connect the measuring adapter [A] between these connectors as shown.

Main Harness [B]

Fuel Injector [C]

Special Tool - Measuring Adapter: 57001-1700

- Connect a digital meter [D] to the measuring adapter lead.

Fuel Injector Power Source Voltage

Connections to Adapter:

Digital Meter (+) → R (injector BR/W) lead

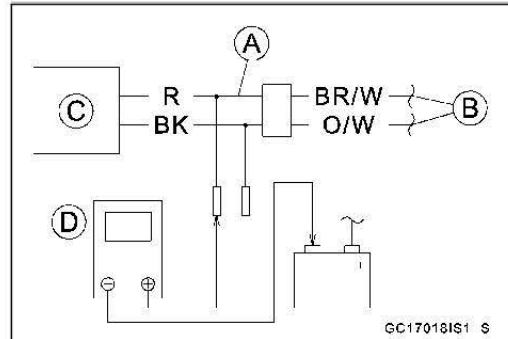
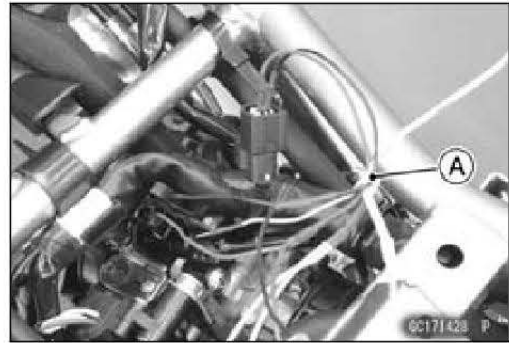
Digital Meter (-) → Battery (-) Terminal

- Measure the power source voltage with the engine stopped and with the connector jointed.
- Turn the ignition switch on.

Power Source Voltage

Standard: Battery Voltage

- Turn the ignition switch off.
- ★ If the reading is in specification, check the output voltage (see Fuel Injector Output Voltage Inspection(3-77)).
- ★ If the reading is out of standard, check the power source wiring (see Fuel Injector Circuit(3-79)).
- ★ If the wiring is good, check the ECU for its ground and power supply (see ECU Power Supply Inspection(3-93)).
- ★ If the ground and power supply are good, replace the ECU.



Fuel Injector (Service Code 41)

Fuel Injector Output Voltage Inspection

NOTE

○Be sure the battery is fully charged.

- Turn the ignition switch off.
- Remove the ECU (see [ECU Removal\(3-93\)](#)).
- Do not disconnect the ECU connector.
- Connect a digital meter [A] to the connector [B] with the needle adapter set.

Special Tool - Needle Adapter Set: 57001-1874

Fuel Injector Output Voltage

Connections to ECU Connector:

Digital Meter (+) → O/W lead (ECU terminal 16)

Digital Meter (–) → Battery (–) Terminal

- Measure the output voltage with the engine stopped and with the connector joined.
- Turn the ignition switch on.

Output Voltage

Standard: Battery Voltage for 2 seconds, and then 0 V

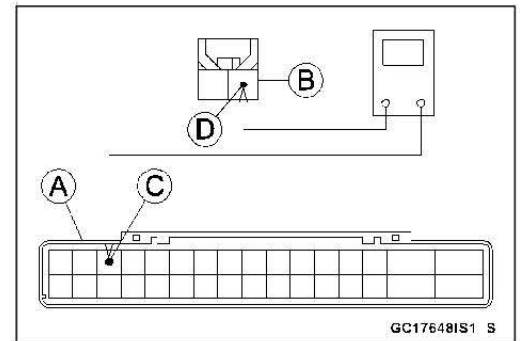
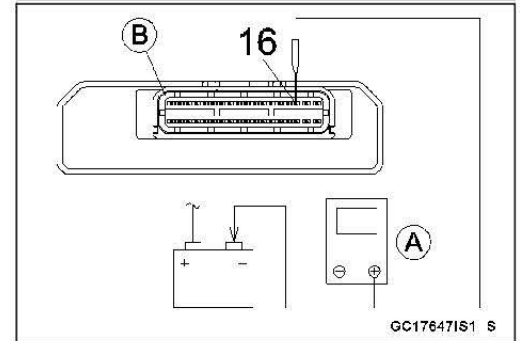
- Turn the ignition switch off.
- ★ If the reading is in specification, check the ECU for its ground and power supply (see [ECU Power Supply Inspection\(3-93\)](#)).
- ★ If the ground and power supply are good, replace the ECU.
- ★ If the reading is out of the specification, remove the ECU and check the wiring for continuity between main harness connectors.
- Disconnect the ECU and fuel injector connector.

Wiring Continuity Inspection

ECU Connector [A] ↔ Fuel Injector Connector [B]

ECU Terminal 16 [C] ↔ Fuel Injector Terminal [D]

- ★ If the wiring is good, check the ECU for its ground and power supply (see [ECU Power Supply Inspection\(3-93\)](#)).
- ★ If the ground and power supply are good, replace the ECU.



3-78 FUEL SYSTEM (DFI)

Fuel Injector (Service Code 41)

Fuel Injector Fuel Line Inspection

- Remove:
 - Fuel Tank (see Fuel Tank Removal(3-113))
 - Fuel Hose (see Fuel Hose Replacement(2-22))
- Be sure to place a piece of cloth around the fuel outlet pipe of the fuel pump and the delivery pipe.

WARNING

Fuel is flammable and explosive under certain conditions and can cause severe burns. Be prepared for fuel spillage; any spilled fuel must be completely wiped up immediately. When the fuel hose is disconnected, fuel spills out from the hose and the pipe because of residual pressure. Cover the hose connection with a piece of clean cloth to prevent fuel spillage.

- Check the fuel injector fuel line for leakage as follows.
- Connect a commercially available vacuum/pressure pump [A] to the nipple of the delivery pipe [B] with the fuel hose [C] (both ends with the clamps [D]) as shown.
- Upside View [E]
- Apply soap and water solution to the areas [F] as shown.
- Watching the pressure gauge, squeeze the pump lever [G], and build up the pressure until the pressure reaches the maximum pressure.

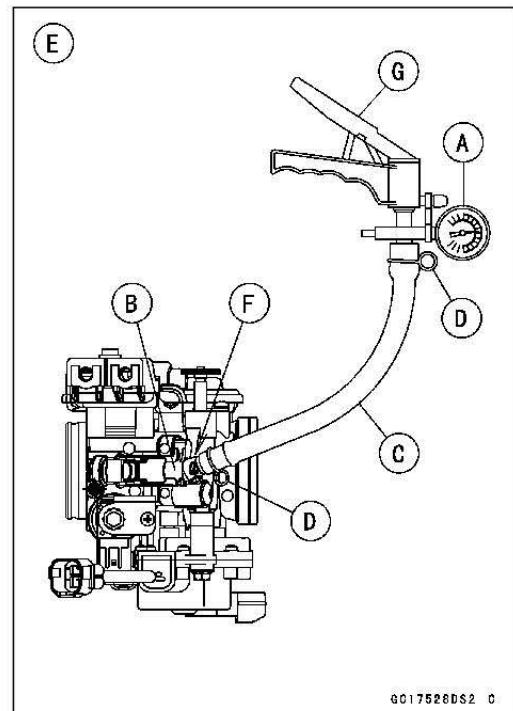
Injector Fuel Line Maximum Pressure

Standard: 300 kPa (3.06 kgf/cm², 43 psi)

NOTICE

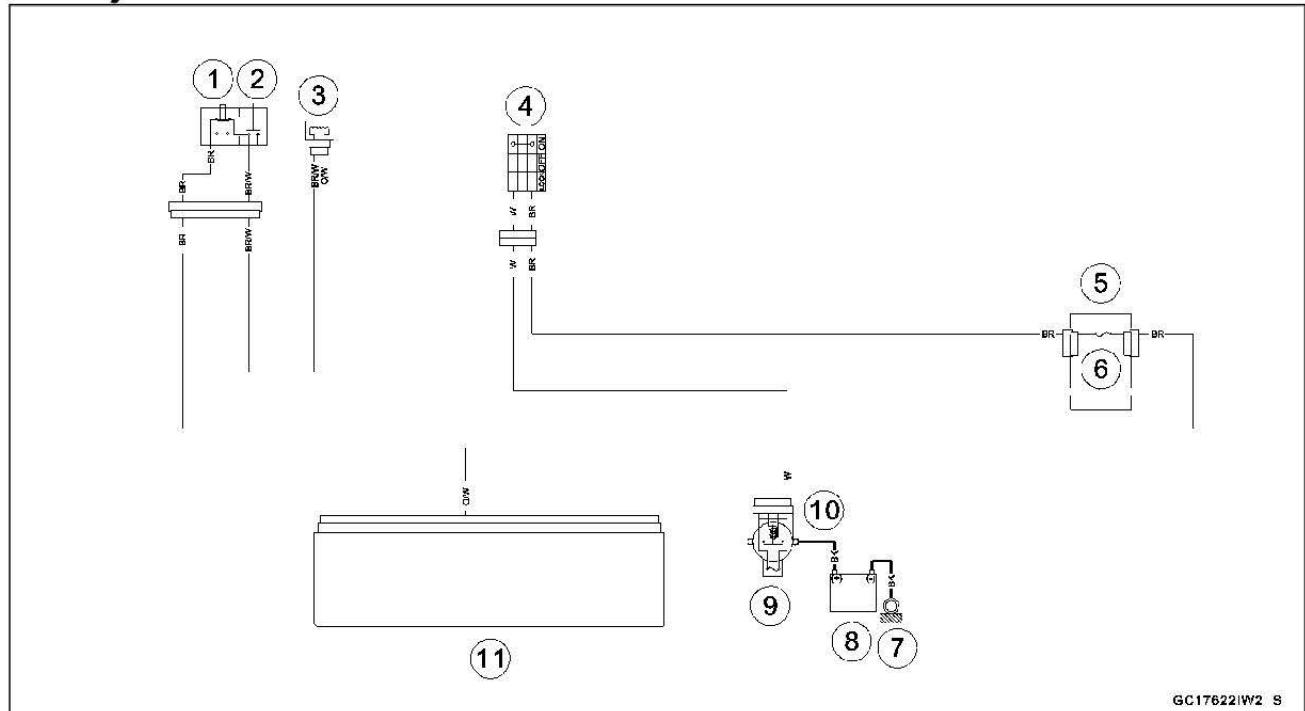
During pressure testing, do not exceed the maximum pressure for which the system is designed.

- Watch the gauge for at least 6 seconds.
- ★ If the pressure holds steady, the fuel line is good.
- ★ If the pressure drops at once or if bubbles are found in the area, the fuel line is leaking. Replace the delivery pipe, fuel injector and related parts.
- Repeat the leak test, and check the fuel line for no leakage.
- Install:
 - Fuel Hose (see Fuel Hose Replacement(2-22))
 - Fuel Tank (see Fuel Tank Installation(3-115))
- Start the engine and check for fuel leakage.



Fuel Injector (Service Code 41)

Fuel Injector Circuit



1. Engine Stop Switch
2. Starter Button
3. Fuel Injector
4. Ignition Switch
5. Fuse Box (2)
6. Ignition Fuse 10 A
7. Engine Ground
8. Battery
9. Main Fuse 20 A
10. Starter Relay
11. ECU

3-80 FUEL SYSTEM (DFI)

Fuel Pump Relay (Service Code 46)

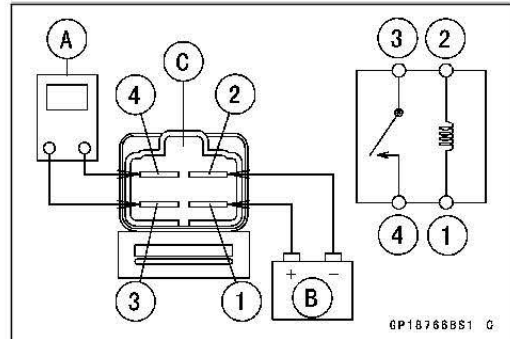
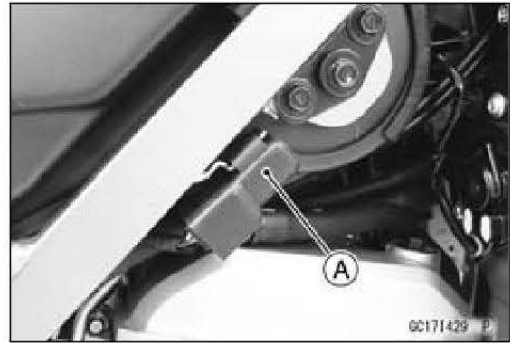
Fuel Pump Relay Inspection

- Remove:
 - Right Shroud (see Shroud Removal(15-10))
 - Remove the fuel pump relay [A] from the bracket.
 - Disconnect the connector to remove the relay.
-
- Connect a digital meter [A] between the relay terminals [3] and [4].
 - Connect a 12 V battery [B] between the relay terminals [1] and [2].
 - ★ If the relay [C] does not work as specified, the relay is defective. Replace the relay.

Testing Relay

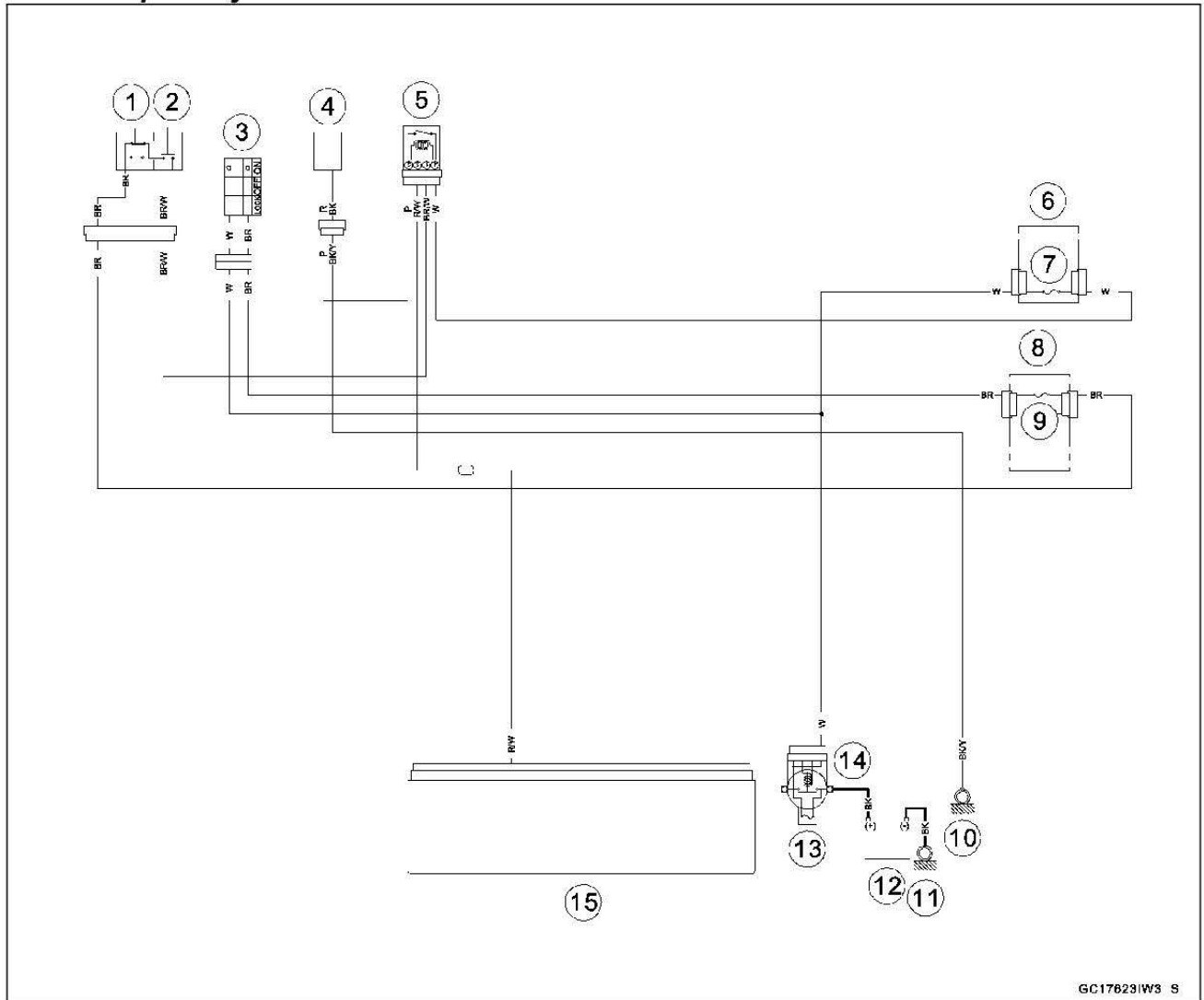
Criteria:

When battery is connected	→ 0 Ω
When battery is disconnected	→ $\infty \Omega$



Fuel Pump Relay (Service Code 46)

Fuel Pump Relay Circuit



1. Engine Stop Switch
2. Starter Button
3. Ignition Switch
4. Fuel Pump
5. Fuel Pump Relay
6. Fuse Box (1)
7. ECU Fuse 15 A
8. Fuse Box (2)
9. Ignition Fuse 10 A
10. Frame Ground
11. Engine Ground
12. Battery
13. Main Fuse 20 A
14. Starter Relay
15. ECU

3-82 FUEL SYSTEM (DFI)

Ignition Coil (Service Code 51)

Ignition Coil Removal

- Refer to the Ignition Coil Removal (see Ignition Coil Removal(16-37)).

Ignition Coil Installation

- Refer to the Ignition Coil Installation (see Ignition Coil Installation(16-37)).

Ignition Coil Primary Winding Resistance Inspection

- Refer to the Ignition Coil Inspection (see Ignition Coil Inspection(16-38)).
- ★ If the reading is within the standard, check the input voltage (see Ignition Coil Input Voltage Inspection(3-82)).

Ignition Coil Input Voltage Inspection

NOTE

○ Be sure the battery is fully charged.

- Turn the ignition switch off.
- Remove the ECU (see ECU Removal(3-93)).
- Do not disconnect the ECU connector.
- Connect a digital meter [A] to the connector [B] with the needle adapter set.

Special Tool - Needle Adapter Set: 57001-1874

Ignition Coil Input Voltage

Connections to ECU Connector:

Digital Meter (+) → O lead (ECU terminal 18)

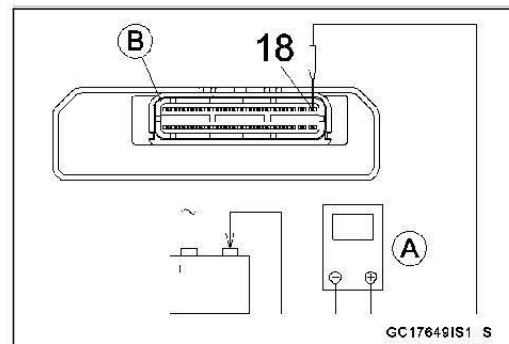
Digital Meter (–) → Battery (–) Terminal

- Measure the input voltage to the primary winding of the ignition coil with the engine stopped and the connector joined.
- Turn the engine stop switch to run position.
- Turn the ignition switch on.

Input Voltage

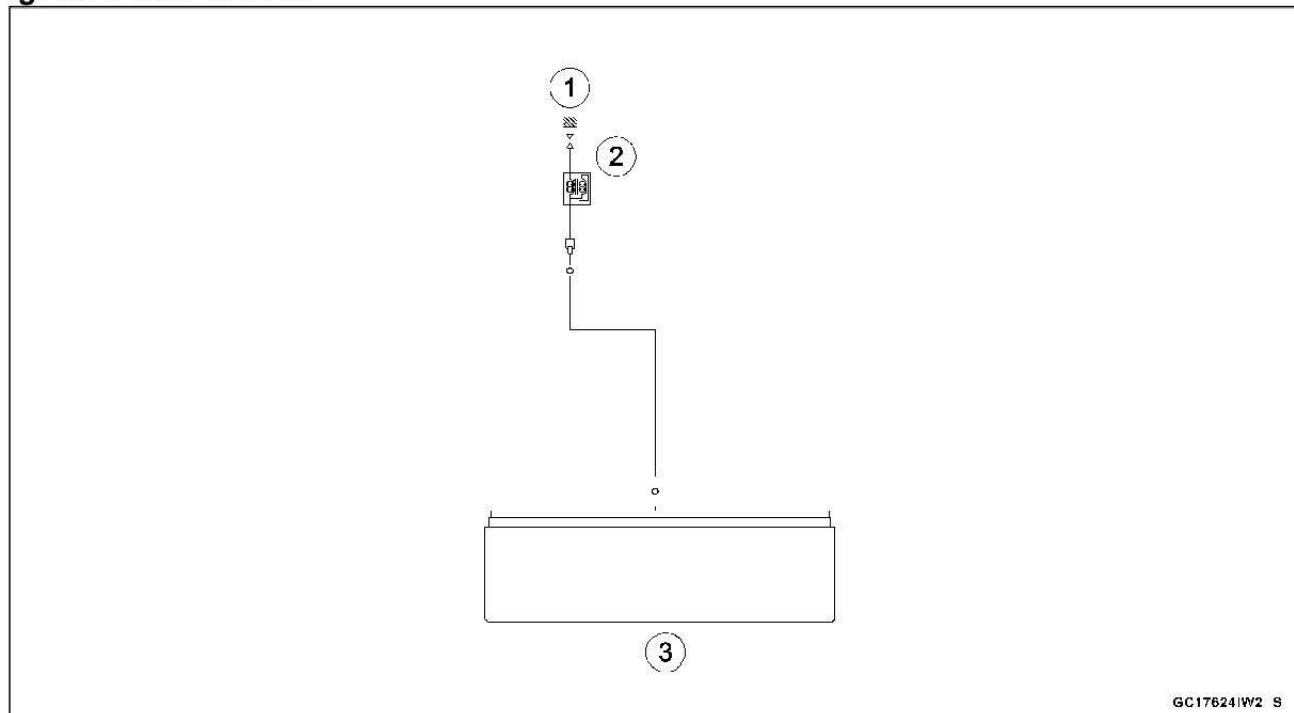
Standard: Battery Voltage

- Turn the ignition switch off.
- ★ If the input voltage is out of the standard, check the wiring for continuity (see Ignition Coil Circuit(3-83)).
- ★ If the wiring is good, check the ECU for its ground and power supply (see ECU Power Supply Inspection(3-93)).
- ★ If the ground and power supply are good, replace the ECU.
- ★ If the input voltage is within the standard, check the ECU for its ground and power supply (see ECU Power Supply Inspection(3-93)).
- ★ If the ground and power supply are good, replace the ECU.



Ignition Coil (Service Code 51)

Ignition Coil Circuit



GC17624/W2 S

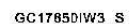
- 1. Spark Plug
- 2. Ignition Coil
- 3. ECU

Radiator Fan Relay (Service Code 56)

- Refer to the Radiator Fan Relay Inspection (see Radiator Fan Relay Inspection(16-63)).

- Refer to the Radiator Fan Relay Inspection (see Radiator Fan Relay Inspection(16-63)).

- ### Radiator Fan Relay Circuit



1. Ignition Switch
2. Fan Motor
3. Fan Relay
4. Water Temperature Sensor
5. Fuse Box (1)
6. Radiator Fan Fuse 10 A
7. Frame Grounds
8. Engine Ground
9. Battery
10. Main Fuse 20 A
11. Starter Relay
12. ECU

Subthrottle Valve Actuator (Service Code 62)

Subthrottle Valve Actuator Removal

NOTICE

Do not remove the subthrottle valve actuator [A] since it has been adjusted and set with precision at the factory.

Never drop the throttle body assy especially on a hard surface. Such a shock to the subthrottle valve actuator can damage it.

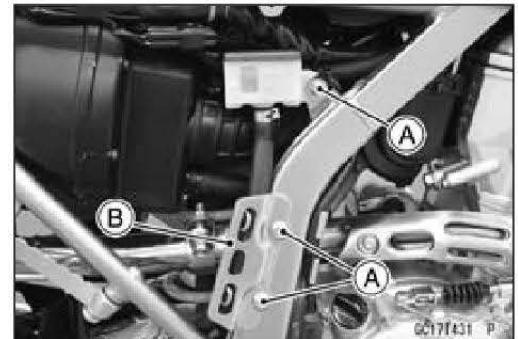


Subthrottle Valve Actuator Inspection

NOTE

○Be sure the battery is fully charged.

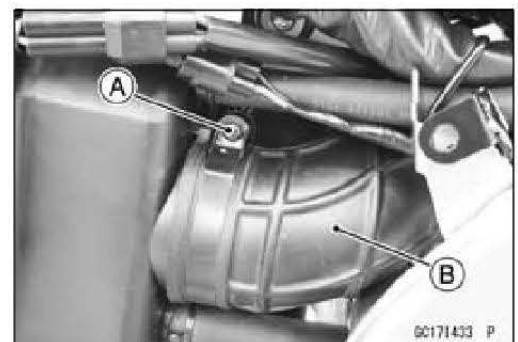
- Remove:
 - Right Side Cover (see Side Cover Removal(15-8))
 - Bolts [A]
 - Guard [B]



- Loosen:
 - Air Cleaner Housing Clamp Screw [A]



- Loosen:
 - Clamp Screw [A]
- Remove:
 - Air Cleaner Duct [B]



- Turn the ignition switch on.
- Check to see that all the subthrottle valve [A] open and close smoothly.
- Turn the ignition switch off.
- ★ If the subthrottle valve do not operate, check the subthrottle valve actuator resistance (see Subthrottle Valve Actuator Resistance Inspection(3-86)).

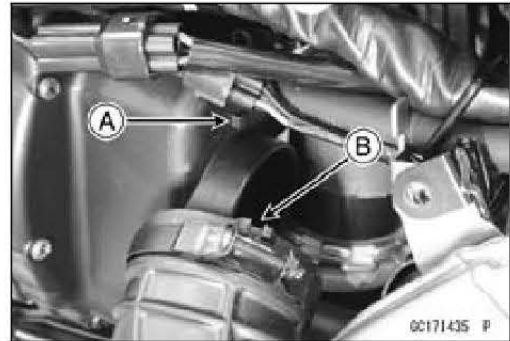


3-86 FUEL SYSTEM (DFI)

Subthrottle Valve Actuator (Service Code 62)

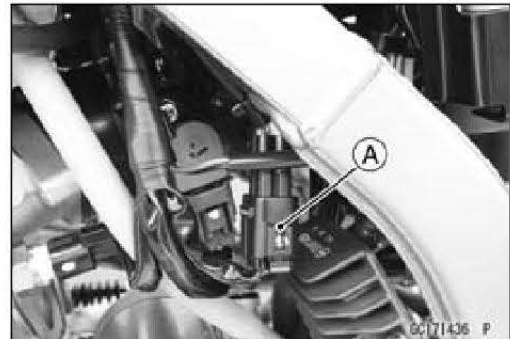
- When install the air cleaner duct, fit the air cleaner housing projection [A] to the air cleaner duct groove [B].

Torque - Air Cleaner Housing Clamp Screw: 2.0 N·m (0.20 kgf·m, 18 in·lb)



Subthrottle Valve Actuator Resistance Inspection

- Turn the ignition switch off.
- Disconnect the subthrottle valve actuator connector [A].



- Connect a digital meter to the subthrottle valve actuator connector.
- Measure the subthrottle valve actuator resistance.

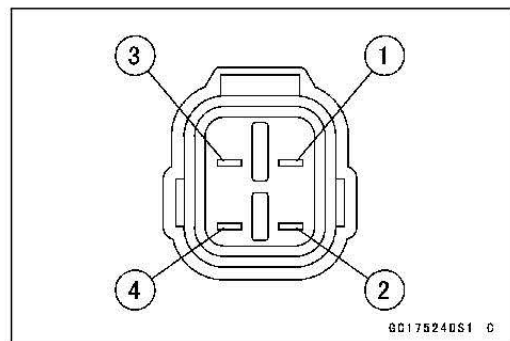
Subthrottle Valve Actuator Resistance

Connections: G lead [1] ↔ W/BL lead [2]

BK lead [3] ↔ P lead [4]

Standard: About 5 ~ 8 Ω

- ★ If the reading is out of the standard, replace the throttle body assy.
- ★ If the reading is within the standard, check the input voltage (see Subthrottle Valve Actuator Input Voltage Inspection(3-87)).



Subthrottle Valve Actuator (Service Code 62)

Subthrottle Valve Actuator Input Voltage Inspection

NOTE

○Be sure the battery is fully charged.

- Turn the ignition switch off.
- Disconnect the subthrottle valve actuator connector and connect the measuring adapter [A] between these connectors as shown.

Main Harness [B]

Subthrottle Valve Actuator [C]

Special Tool - Measuring Adapter: 57001-1700

- Connect the peak voltage adapter [D] and a digital meter [E] to the measuring adapter leads.

Special Tool - Peak Voltage Adapter: 57001-1415

Type: KEK-54-9-B

Subthrottle Valve Actuator Input Voltage

Connections to Adapter:

- (I) Digital Meter (+) → R (actuator G) lead
Digital Meter (-) → Battery (-) Terminal
- (II) Digital Meter (+) → BK (actuator BK) lead
Digital Meter (-) → Battery (-) Terminal
- (III) Digital Meter (+) → W (actuator P) lead
Digital Meter (-) → Battery (-) Terminal
- (IV) Digital Meter (+) → Y (actuator W/BL) lead
Digital Meter (-) → Battery (-) Terminal

- Measure the actuator input voltage with the engine stopped and with the connector joined.
- Turn the ignition switch on.

Input Voltage

Standard: About DC 10.5 ~ 12.5 V, and then 0 V or
About DC 10.5 ~ 12.5 V

- Turn the ignition switch off.
- ★ If the reading is in specification, but the actuator does not operate, replace the throttle body assy.
- ★ If the reading is out of the specification, remove the ECU and check the wiring for continuity between main harness connectors.
- Disconnect the ECU and actuator connectors.

Wiring Inspection

ECU Connector [A] ↔

Subthrottle Valve Actuator Connector [B]

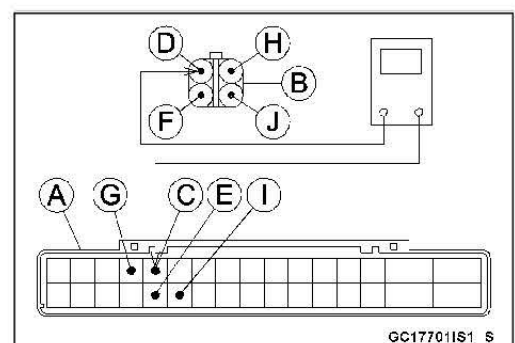
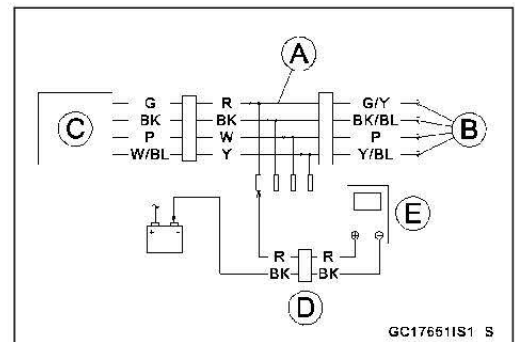
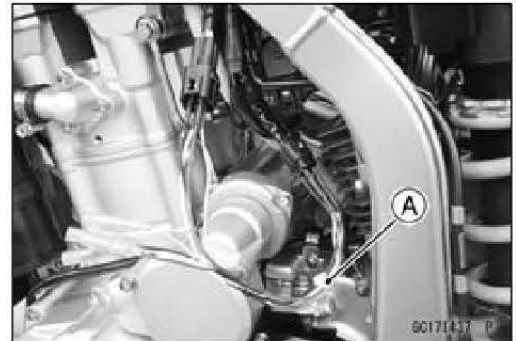
ECU terminal 14 [C] ↔ Sensor Terminal [D]

ECU terminal 32 [E] ↔ Sensor Terminal [F]

ECU terminal 15 [G] ↔ Sensor Terminal [H]

ECU terminal 31 [I] ↔ Sensor Terminal [J]

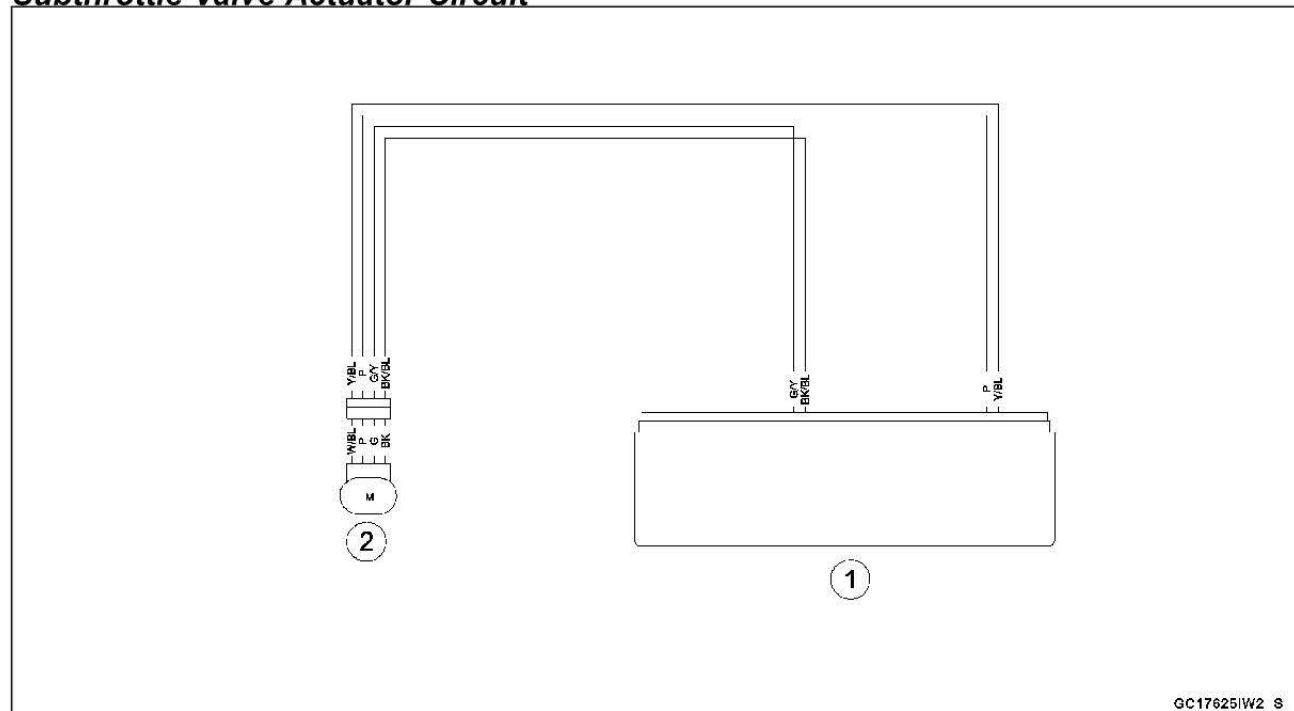
- ★ If the wiring is good, check the ECU for its ground and power supply (see ECU Power Supply Inspection(3-93)).
- ★ If the ground and power supply are good, replace the ECU.



3-88 FUEL SYSTEM (DFI)

Subthrottle Valve Actuator (Service Code 62)

Subthrottle Valve Actuator Circuit



1. ECU

2. Subthrottle Valve Actuator

Air Switching Valve (Service Code 64)

Air Switching Valve Removal

- Refer to the Air Switching Valve Removal (see Air Switching Valve Removal(5-13)).

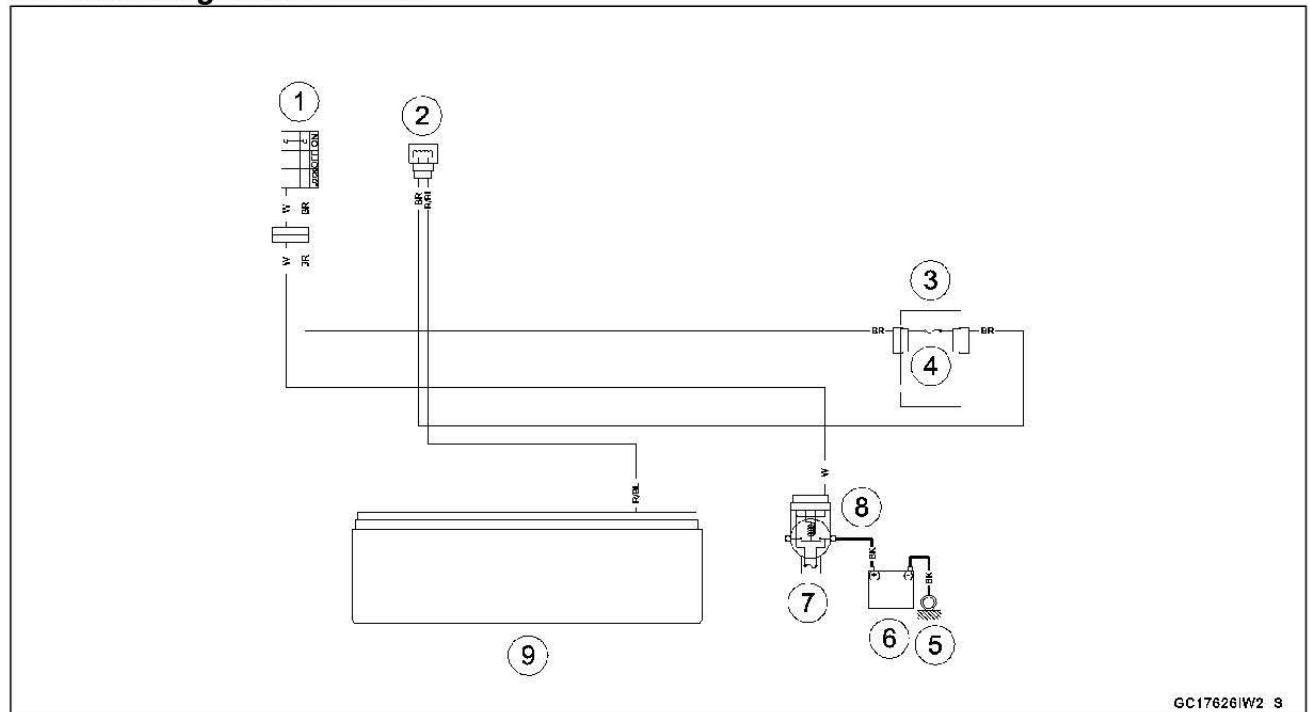
Air Switching Valve Installation

- Refer to the Air Switching Valve Installation (see Air Switching Valve Installation(5-13)).

Air Switching Valve Inspection

- Refer to the Air Switching Valve Unit Test (see Air Switching Valve Unit Test(16-61)).
- ★ If the air switching valve is normal, check the wiring for continuity (see Air Switching Valve Circuit(3-89)).
- ★ If the wiring is good, check the ECU for its ground and power supply (see ECU Power Supply Inspection(3-93)).
- ★ If the ground and power supply are good, replace the ECU.

Air Switching Valve Circuit



1. Ignition Switch
2. Air Switching Valve
3. Fuse Box (2)
4. Ignition Fuse 10 A
5. Engine Ground
6. Battery
7. Main Fuse 20 A
8. Starter Relay
9. ECU

3-90 FUEL SYSTEM (DFI)

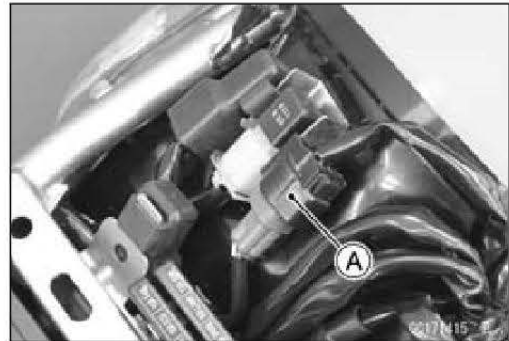
Oxygen Sensor Heater (Service Code 67)

Oxygen Sensor Heater Removal

The oxygen sensor heater is built in the oxygen sensor. So, the heater itself can not be removed. Remove the oxygen sensor (see Oxygen Sensor Removal(16-77)).

Oxygen Sensor Heater Resistance Inspection

- Turn the ignition switch off.
- Remove:
 - Seat (see Seat Removal (15-7))
- Remove the oxygen sensor lead connector [A] from the bracket.
- Disconnect the connector.



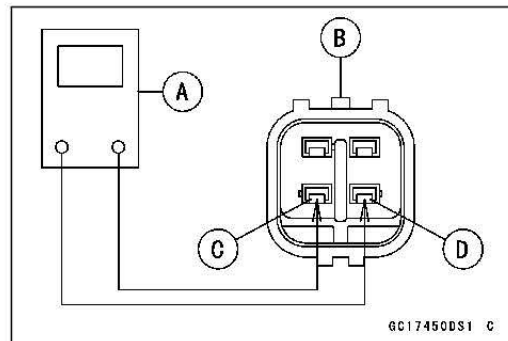
- Connect a digital meter [A] to the oxygen sensor lead connector [B].
- Measure the oxygen sensor heater resistance.

Oxygen Sensor Heaters Resistance

Connections: W lead [C] ↔ W lead [D]

Standard: 6.7 ~ 10.5 Ω @20° C (68°F)

- ★ If the reading is out of the standard, replace the sensor.
- ★ If the reading is within the standard, check the power supply voltage (see Oxygen Sensor Heater Power Source Voltage Inspection(3-90)).



Oxygen Sensor Heater Power Source Voltage Inspection

NOTE

○ Be sure the battery is fully charged.

- Turn the ignition switch off.
- Disconnect the oxygen sensor lead connector and connect the harness adapter [A] between these connectors.
 - Main Harness [B]
 - Oxygen Sensor [C]

Special Tool - Measuring Adapter: 57001-1700

- Connect a digital meter [D] to the harness adapter lead.

Oxygen Sensor Power Source Voltage

Connections to Adapter:

Digital Meter (+) → R (main harness BR) lead

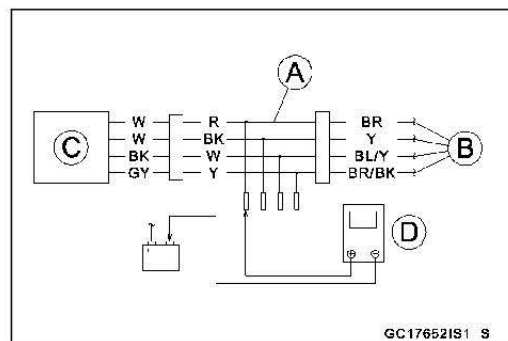
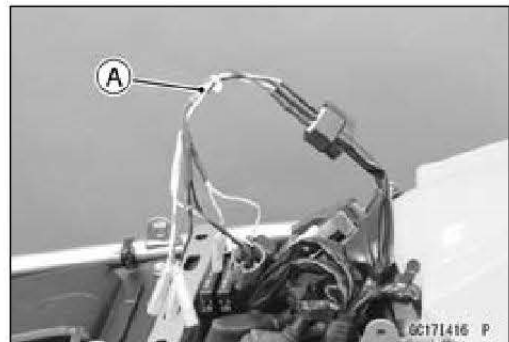
Digital Meter (-) → Battery (-) terminal

- Measure the power source voltage with the engine stopped and with the connector joined.
- Turn the ignition switch on.

Power Source Voltage

Standard: Battery Voltage

- Turn the ignition switch off.
- ★ If the reading is in specification, but the problem still exists, replace the ECU.
- ★ If the reading is out of the standard, check the following.
 - Power Source Wiring (see Oxygen Sensor Circuit(3-91))



Oxygen Sensor Heater (Service Code 67)

- ★ If the wiring is good, remove the ECU and check the wiring for continuity between main harness connectors.
- Disconnect the ECU and sensor connectors.

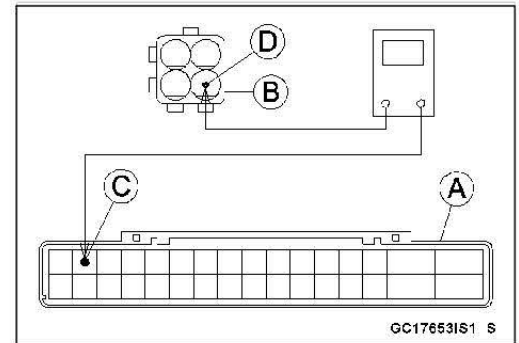
Wiring Inspection

ECU Connector [A] ↔

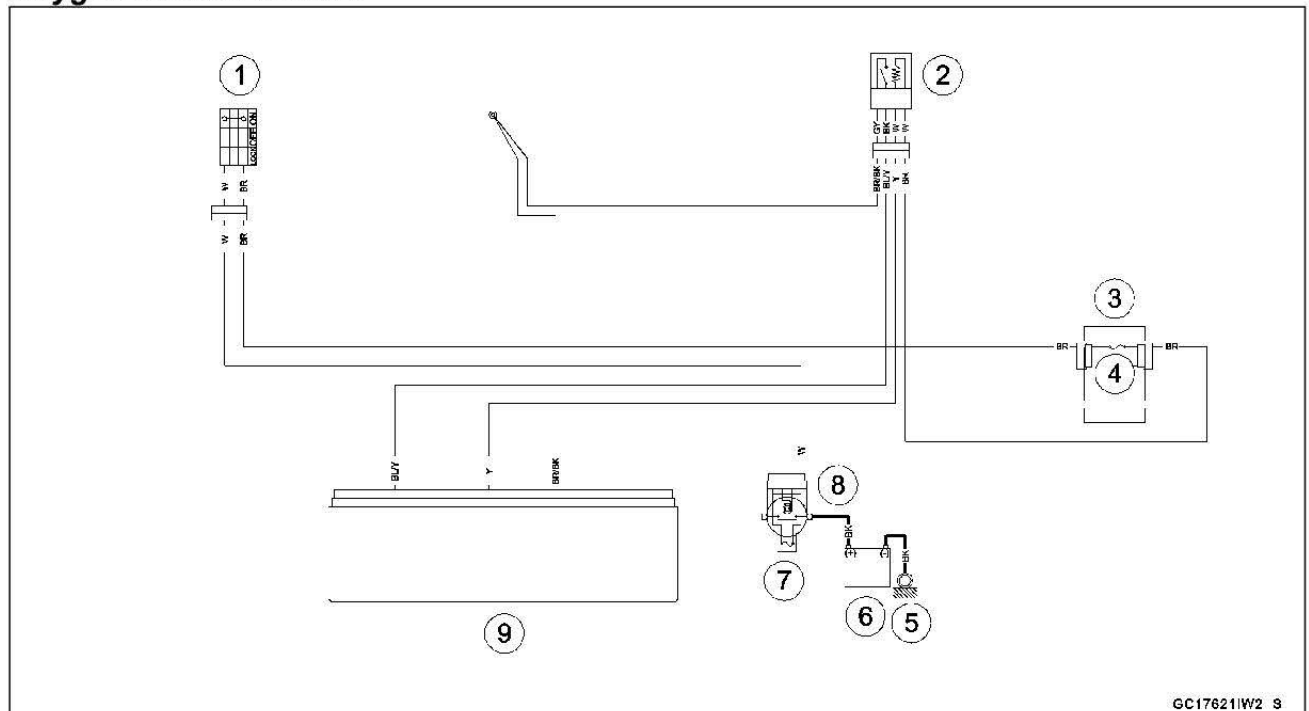
Oxygen Sensor Connector [B]

ECU terminal 17 [C] ↔ Sensor Terminal [D]

- ★ If the wiring is good, check the ECU for its ground and power supply (see ECU Power Supply Inspection(3-93)).
- ★ If the ground and power supply are good, replace the ECU.



Oxygen Sensor Circuit



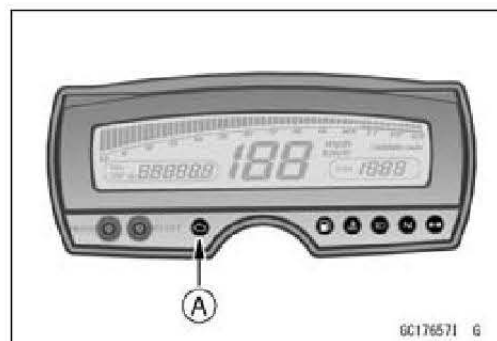
1. Ignition Switch
2. Oxygen Sensor
3. Fuse Box (2)
4. Ignition Fuse 10 A
5. Engine Ground
6. Battery
7. Main Fuse 20 A
8. Starter Relay
9. ECU

3-92 FUEL SYSTEM (DFI)

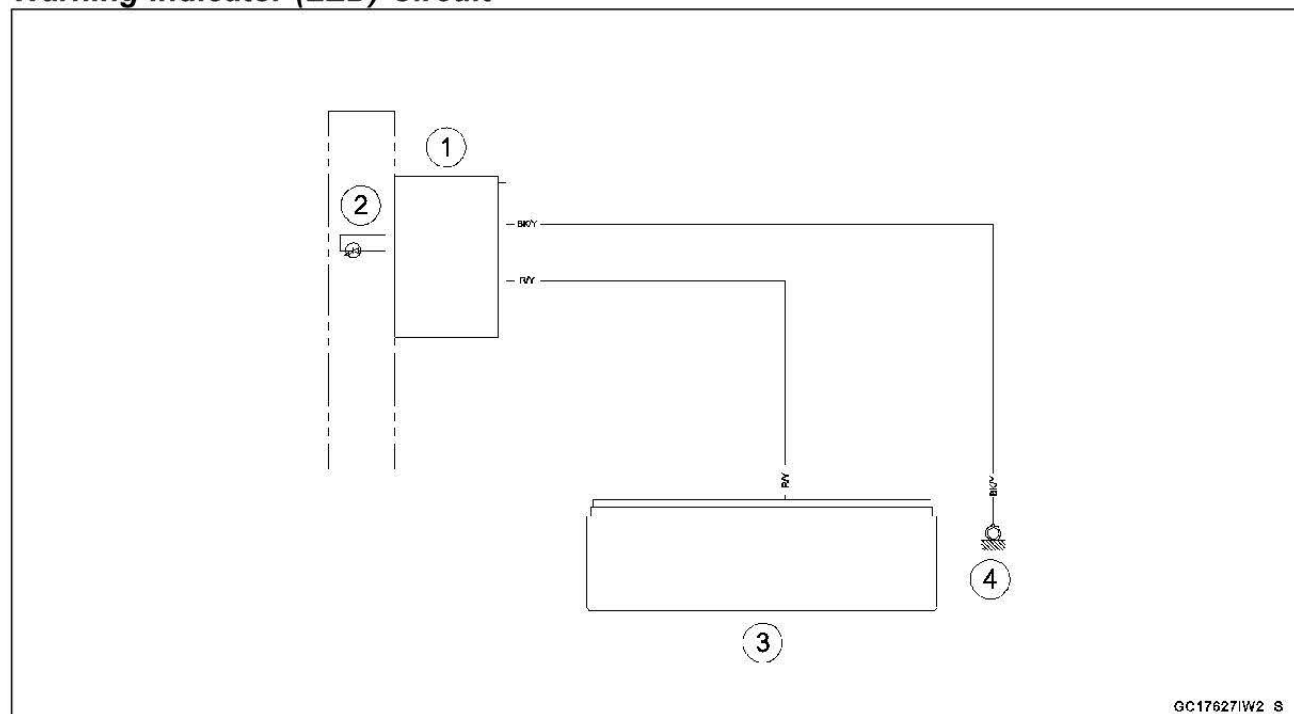
Warning Indicator Light (LED)

Yellow Engine Warning Indicator Light (LED) Inspection

- In this model, the yellow engine warning indicator light (LED) [A] goes on or blinks by the data sent from the ECU.
- Refer to the Meter Unit Inspection (see Meter Unit Inspection(16-66)).



Warning Indicator (LED) Circuit



1. Meter Unit
2. Yellow Engine Warning Indicator Light (LED)
3. ECU
4. Frame Ground

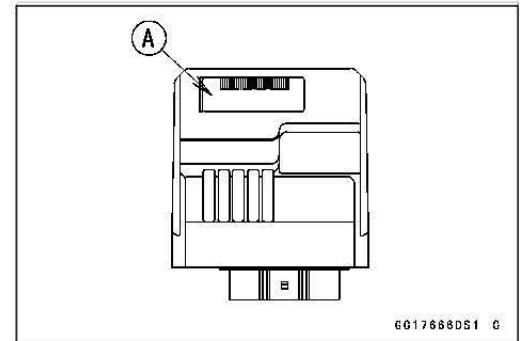
ECU

ECU Identification

○Most countries have their own regulations, so each ECU has different characteristic. So, do not confuse ECU with each other and use only the ECU for your model. Otherwise, the motorcycle cannot clear the regulation.

ECU Identification

Part Number [A]	Specification
21175-1727	KLX300D
21175-1728	KLX300E

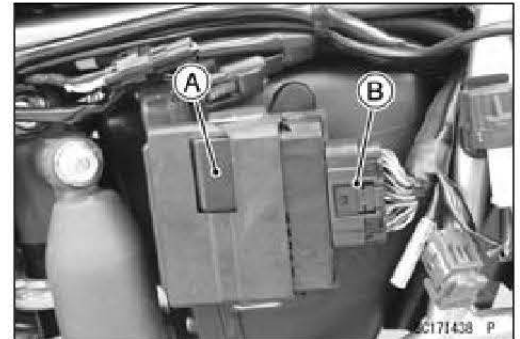


ECU Removal

NOTICE

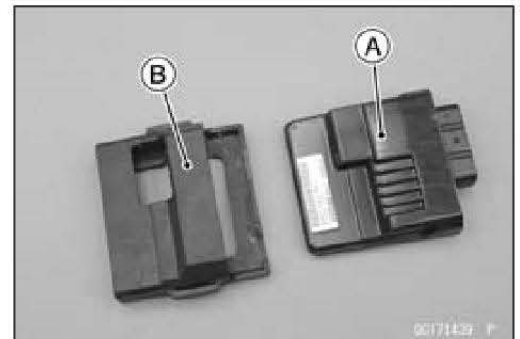
Never drop the ECU especially on a hard surface. Such a shock to the ECU can damage it.

- Remove:
Left Side Cover (see Side Cover Removal(15-8))
- Pull the ECU [A] with rubber protector from the bracket.
- Disconnect the ECU connector [B].
- Remove the ECU from the rubber protector.

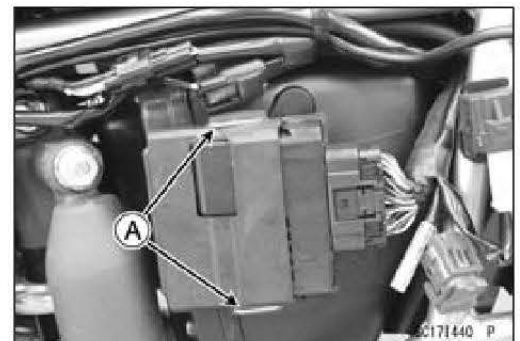


ECU Installation

- Install the ECU [A] into the rubber protector [B].
- Connect the ECU Connector.

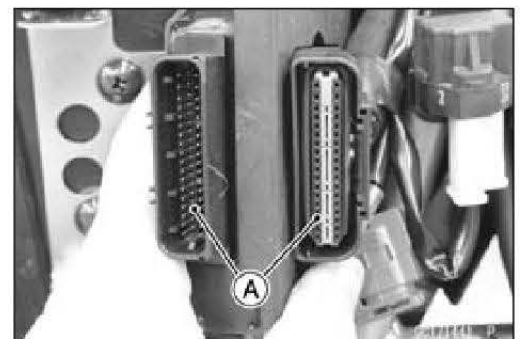


- Insert the slits [A] of the rubber protector to the bracket.
- Install the removed parts.



ECU Power Supply Inspection

- Remove:
Left Side Cover (see Side Cover Removal(15-8))
- Visually inspect the ECU connector.
- ★ If the connector is clogged with mud or dust, blow it off with compressed air.
- Disconnect the ECU connector (see ECU Removal(3-93)).
- Visually inspect the terminals [A] of the ECU and main harness connector.
- ★ If the terminals of the main harness connector is damaged, replace the main harness.
- ★ If the terminals of the ECU connector is damaged, replace the ECU.



3-94 FUEL SYSTEM (DFI)

ECU

- Disconnect the ECU connector [A].
- Set a digital meter [B] and check the following wiring for continuity.

ECU Grounding Inspection

Connections:

- (I) ECU terminal 8 ↔ Battery (–) Terminal
- (II) ECU terminal 35 or 36 ↔ Battery (–) Terminal
- (III) Engine Ground ↔ Battery (–) Terminal

Criteria:

All: 0 Ω

- ★ If no continuity, check the connector, the engine ground lead, or main harness, and repair or replace them if necessary.
- ★ If the wiring is good, check the power source voltage of the ECU.

NOTE

○ Be sure the battery is fully charged.

- Connect the ECU connector.
- Connect a digital meter [A] to the connector [B] with the needle adapter set.

Special Tool - Needle Adapter Set: 57001-1874

ECU Power Supply Inspection

Connections:

- (I) Digital Meter (+) → Terminal 1 (BR)
Digital Meter (–) → Battery (–) terminal
- (II) Digital Meter (+) → Terminal 19 (W)
Digital Meter (–) → Battery (–) terminal

ignition Switch off:

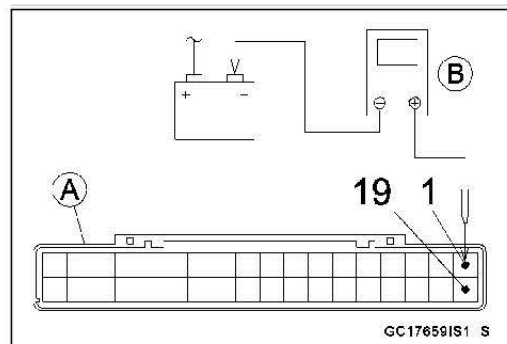
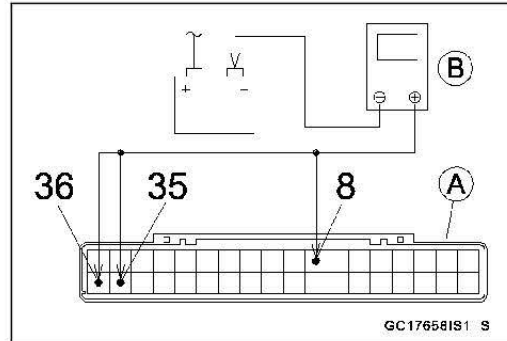
Terminal 1 (BR): 0 V

Terminal 19 (W): Battery Voltage

ignition Switch on:

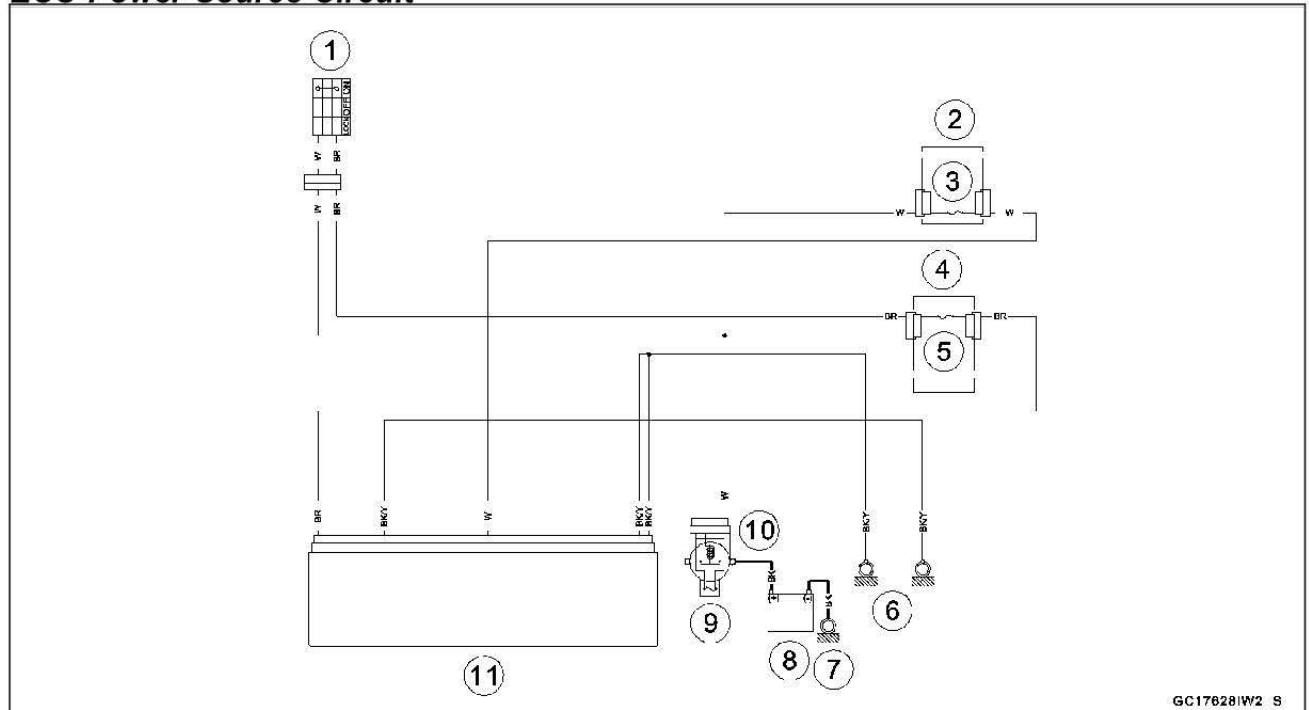
Both: Battery Voltage

- ★ If the reading is out of the specification, check the following.
 - Main Fuse 20 A (see Fuse Inspection(16-81))
 - Power Source Wiring (see ECU Power Source Circuit(3-95))
- ★ If the fuse and wiring are good, replace the ECU.



ECU

ECU Power Source Circuit



1. Ignition Switch
2. Fuse Box (1)
3. ECU Fuse 15 A
4. Fuse Box (2)
5. Ignition Fuse 10 A
6. Frame Grounds
7. Engine Ground
8. Battery
9. Main Fuse 20 A
10. Starter Relay
11. ECU

3-96 FUEL SYSTEM (DFI)

DFI Power Source

ECU Fuse Removal

- Refer to the Fuse Box Fuse Removal (see Fuse Box Fuse Removal(16-80)).

ECU Fuse Installation

- ★ If a fuse fails during operation, inspect the DFI system to determine the cause, and then replace it with a new fuse of proper amperage.
- Refer to the Fuse Installation (see Fuse Installation(16-80)).

ECU Fuse Inspection

- Refer to the Fuse Inspection (see Fuse Inspection(16-81)).

Fuel Line

Fuel Pressure Inspection

NOTE

○Be sure the battery is fully charged.

- Remove:

- Fuel Tank (see Fuel Tank Removal(3-113))

- Fuel Hose (see Fuel Hose Replacement(2-22))

○Be sure to place a piece of cloth around the fuel outlet pipe of the fuel pump and the delivery pipe of the throttle body assy.



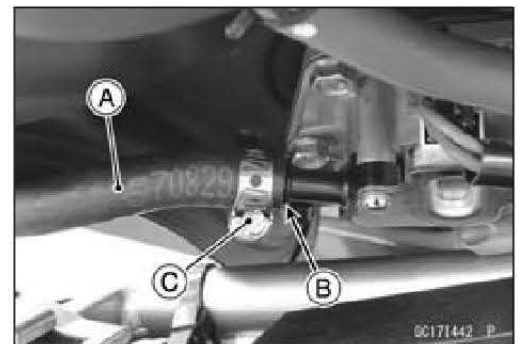
WARNING

Fuel is flammable and explosive under certain conditions and can cause severe burns. Be prepared for fuel spillage; any spilled fuel must be completely wiped up immediately. When the fuel hose is disconnected, fuel spills out from the hose and the pipe because of residual pressure. Cover the hose connection with a piece of clean cloth to prevent fuel spillage.

- Connect the fuel hose (Special Tool: 57001-1607) [A] until the ridge [B] on the fuel outlet pipe.

○Place the clamp [C] at back of the ridge.

Special Tool - Fuel Hose: 57001-1607

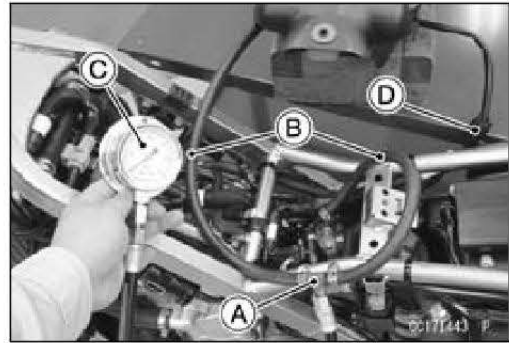


3-98 FUEL SYSTEM (DFI)

Fuel Line

- Install the fuel pressure gauge adapter [A] and fuel hoses (Special Tool: 57001-1607) [B] between the fuel outlet pipe and delivery pipe.
- Secure the fuel hoses with the clamps.
- Connect the pressure gauge [C] to the fuel pressure gauge adapter.

Special Tools - Oil Pressure Gauge, 5 kgf/cm²: 57001-125
Fuel Pressure Gauge Adapter: 57001-1593
Fuel Hose: 57001-1607



WARNING

Fuel is extremely flammable and can be explosive under certain conditions resulting in serious injury or death.

Do not try to start the engine with the fuel hoses disconnected.

- Connect:
 - Fuel Pump Lead Connector [D]
 - Turn the engine stop switch run position.
 - Turn the ignition switch on.
- The fuel pump should operate for 2 seconds, and then should stop.

NOTE

○After turning on the engine stop switch and ignition switch, inspect the fuel leakage from the connected portion of the special tools.

NOTICE

Do not operate the fuel pump without fuel in the fuel tank. If the fuel pump is driven without fuel, it may be damaged.

- Start the engine, and let it idle.
- Measure the fuel pressure with the engine idling.

Fuel Pressure (with Engine Idling)

Standard: 294 kPa (3.0 kgf/cm², 43 psi)

Fuel Line

NOTE

○The gauge needle will fluctuate. Read the pressure at the average of the maximum and minimum indications.

- Turn the ignition switch off.
- ★ If the fuel pressure is much higher than specified, replace the fuel pump because the fuel pressure regulator in the fuel pump have been clogged or stuck.
- ★ If the fuel pressure is much lower than specified, check the following.
 - Fuel Line Leakage (see Fuel Injector Fuel Line Inspection(3-78))
 - Amount of Fuel Flow (see Fuel Flow Rate Inspection(3-99))
- After above checks, measure the fuel pressure again.
- Remove the fuel pressure gauge, hoses and adapter.
- Install:
 - Fuel Hose (see Fuel Hose Replacement(2-22))
 - Fuel Tank (see Fuel Tank Installation(3-115))
- Start the engine and check for fuel leakage.

Fuel Flow Rate Inspection

WARNING

Gasoline is extremely flammable and can be explosive under certain conditions, creating the potential for serious burns. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light. Do not smoke. Turn the ignition switch OFF. Be prepared for fuel spillage; any spilled fuel must be completely wiped up immediately.

NOTE

○Be sure the battery is fully charged.

- Turn the ignition switch off.
- Wait until the engine cools down.
- Prepare a fuel hose (Special Tool: 57001-1607) and a measuring cylinder.

Special Tool - Fuel Hose: 57001-1607

- Open the fuel tank cap [A] to lower the pressure in the tank.
- Remove the fuel outlet hose from the fuel pump (see Fuel Tank Removal(3-113)).
- Be sure to place a piece of cloth around the fuel outlet pipe of the fuel pump.

WARNING

Fuel is flammable and explosive under certain conditions and can cause severe burns. Be prepared for fuel spillage; any spilled fuel must be completely wiped up immediately. When the fuel hose is disconnected, fuel spills out from the hose and the pipe because of residual pressure. Cover the hose connection with a piece of clean cloth to prevent fuel spillage.

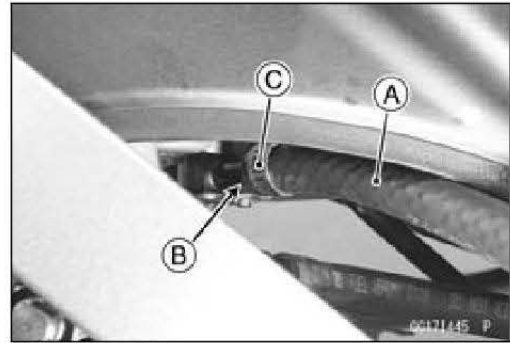


3-100 FUEL SYSTEM (DFI)

Fuel Line

- Connect the fuel hose (Special Tool: 57001-1607) [A] until the ridge [B] on the fuel outlet pipe.
- Place the clamp [C] at back of the ridge.

Special Tool - Fuel Hose: 57001-1607

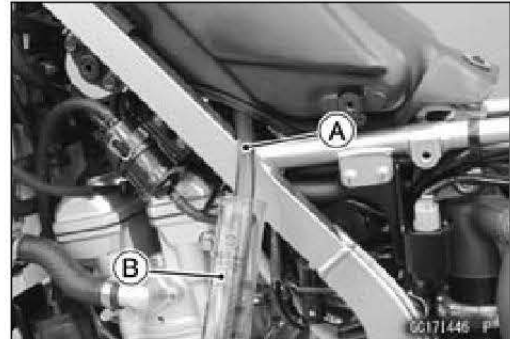


- Insert the fuel hose [A] into the measuring cylinder [B].

WARNING

**Wipe off spilled out fuel immediately.
Be sure to hold the measuring cylinder vertical.**

- Close the fuel tank cap.
- Turn the engine stop switch to run position.
- Turn the ignition switch on.
- The fuel pump should operate for 2 seconds, and then should stop.



NOTICE

Do not operate the fuel pump without fuel in the fuel tank. If the fuel pump is driven without fuel, it may be damaged.

- Measure the discharge for 2 seconds.
- Repeat this operation several times.

Amount of Fuel Flow

Standard: 11 mL (0.4 US oz.) or more for 2 seconds

- Turn the ignition switch off.
- ★ If the fuel flow is much less than the specified, replace the fuel pump.
- Install the fuel tank.
- Start the engine and check for fuel leakage.

Fuel Pump

Fuel Pump Removal

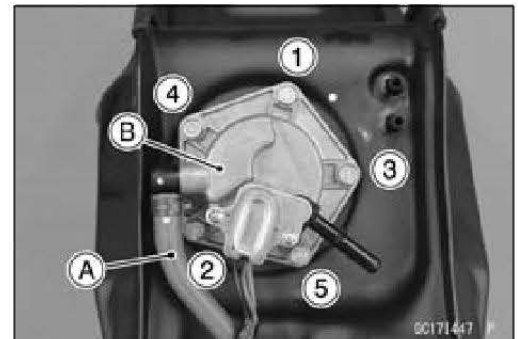
WARNING

Gasoline is extremely flammable and can be explosive under certain conditions, creating the potential for serious burns. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light. Do not smoke. Turn the ignition switch off. Disconnect the battery (–) terminal. To avoid fuel spills, draw it from the tank when the engine is cold. Be prepared for fuel spillage; any spilled fuel must be completely wiped up immediately.

NOTICE

Never drop the fuel pump especially on a hard surface. Such a shock to the pump can damage it.

- Draw the fuel out from the fuel tank with a commercially available electric pump.
 - Remove the fuel tank (see Fuel Tank Removal(3-113)).
 - Be careful of fuel spillage from the fuel tank since fuel still remains in the fuel tank and fuel pump. Plug the fuel pipe of the fuel tank.
 - Turn the fuel tank upside down.
 - Disconnect the fuel bypass hose [A] from the fuel pump.
 - Loosen the fuel pump bolts evenly following the specified loosening sequence [1 ~ 5], and remove the fuel pump [B].
-
- Discard the fuel pump O-ring [A].

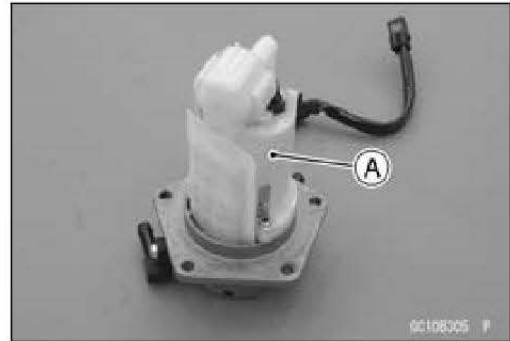


3-102 FUEL SYSTEM (DFI)

Fuel Pump

Fuel Pump Installation

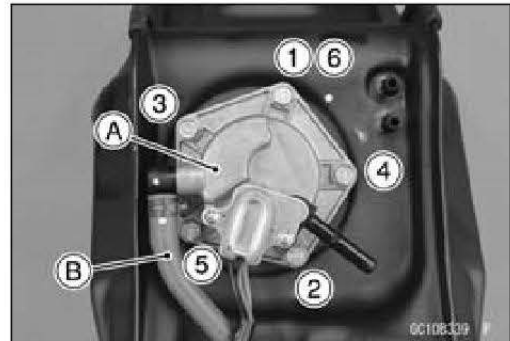
- Remove dirt or dust from the fuel pump [A] by lightly applying compressed air.
- Replace the fuel pump O-ring with a new one.



- Install the fuel pump [A] to the fuel tank.
- Apply a non-permanent locking agent to the threads of the fuel pump bolts.
- Gradually tighten the fuel pump bolts evenly following the specified tightening sequence [1 ~ 6].

Torque - Fuel Pump Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)

- Connect the fuel bypass hose [B] to the fuel pump.



Fuel Pump Operation Inspection

NOTE

○Be sure the battery is fully charged.

- Turn the engine stop switch to run position.
- Turn the ignition switch on and make sure that the fuel pump operates (make light sounds) for 2 seconds, and then stops.
- Turn the ignition switch off.
- ★ If the pump does not operate as described above, check the operating voltage (see Fuel Pump Operating Voltage Inspection(3-103)).

Fuel Pump

Fuel Pump Operating Voltage Inspection

NOTE

○Be sure the battery is fully charged.

- Remove:
Right Side Cover (see Side Cover Removal(15-8))
- Disconnect the fuel pump lead connector and connect the measuring adapter [A] between these connectors as shown.
Main Harness [B]
Fuel Pump [C]

Special Tool - Measuring Adapter: 57001-1700

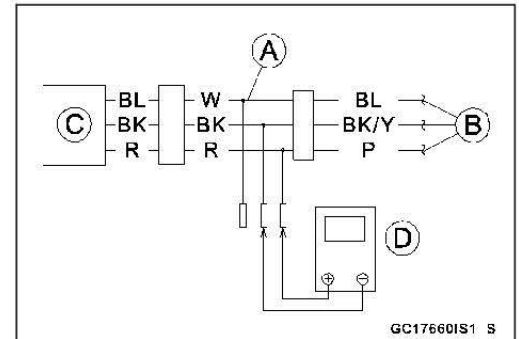
- Connect a digital meter [D] to the measuring adapter leads.

Fuel Pump Operating Voltage

Connections to Adapter:

Digital Meter (+) → R (pump R) lead

Digital Meter (−) → BK (pump BK) lead



- Measure the operating voltage with engine stopped and with the connector joined.
- Turn the ignition switch on.

Operating Voltage

Standard: Battery Voltage for 2 seconds, and then 0 V

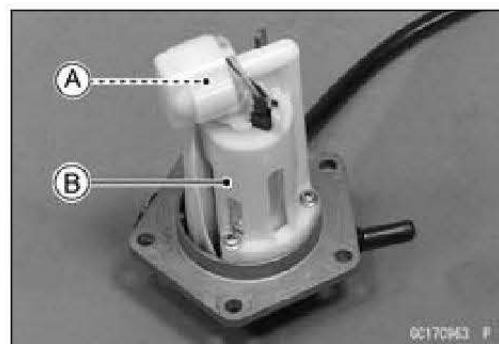
- Turn the ignition switch off.
- ★ If the reading stays on battery voltage and never shows 0 V, check the fuel pump relay (see Fuel Pump Relay Inspection(3-80)).
- ★ If the fuel pump relay is normal, check the ECU for its ground and power supply (see ECU Power Supply Inspection(3-93)).
- ★ If the ground and power supply are good, replace the ECU.
- ★ If there is still no battery voltage, check the fuel pump relay (see Fuel Pump Relay Inspection(3-80)).
- ★ If the fuel pump relay is normal, check the wiring for continuity (see Fuel Pump Circuit(3-105)).
- ★ If the wiring is good, check the ECU for its ground and power supply (see ECU Power Supply Inspection(3-93)).
- ★ If the ground and power supply are good, replace the ECU.
- ★ If the reading is in specification, but the pump does not operate, replace the fuel pump.

3-104 FUEL SYSTEM (DFI)

Fuel Pump

Pressure Regulator Removal

○The pressure regulator [A] is built into the fuel pump [B] and can not be removed.



3-106 FUEL SYSTEM (DFI)

Throttle Grip and Cables

Throttle Grip Free Play Inspection

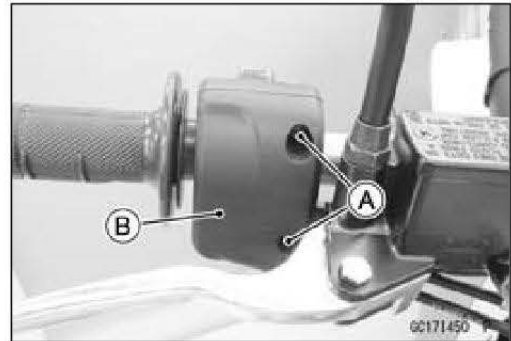
- Refer to the Throttle Control System Inspection (see [Throttle Control System Inspection\(2-18\)](#)).

Throttle Grip Free Play Adjustment

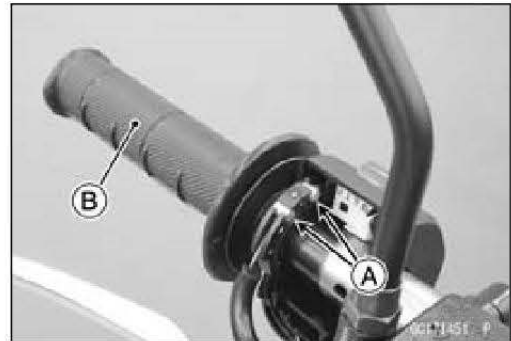
- Refer to the Throttle Control System Inspection (see [Throttle Control System Inspection\(2-18\)](#)).

Throttle Cable Replacement

- Remove the switch housing screws [A].
- Separate the right switch housing [B].

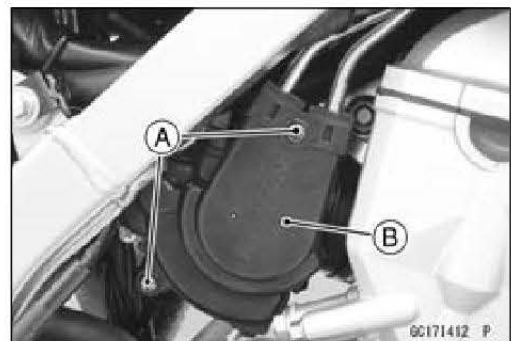


- Remove the throttle cable upper ends [A] from throttle grip [B].

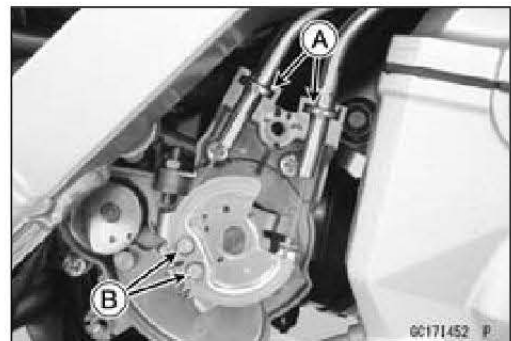


KLX300D Model

- Remove:
 - Throttle Pulley Cover Screws [A]
 - Throttle Pulley Cover [B]



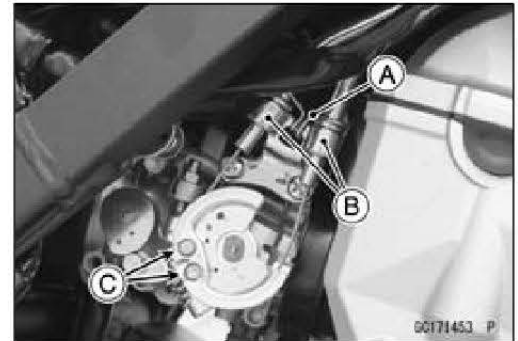
- Remove the throttle cable from holder [A] and remove the cable lower ends [B] from the throttle pulley.



Throttle Grip and Cables

KLX300E Model

- Remove the clip [A].
- Remove the throttle cable from holder [B] and remove the cable lower ends [C] from the throttle pulley.
- Pull out the throttle cable from the frame.



- Lubricate the throttle cable (see Chassis Parts Lubrication (2-59)).
- Apply grease to the upper and lower ends of the throttle cable.
- Install the lower ends of the cable to the throttle pulley.
- Install the cable in accordance with the Cable, Wire, and Hose Routing section in the Appendix chapter.
- Install the right switch housing after installing the upper ends of the cable in the throttle grip.
- For KLX300D model, install the throttle pulley cover and tighten the throttle pulley cover screws.

Torque - Throttle Pulley Cover Screws: 5.0 N·m (0.51 kgf·m, 44 in·lb)

- After installation, adjust each cable properly (see Throttle Control System Inspection(2-18)).

WARNING

Operation with incorrectly routed or improperly adjusted cables could result in an unsafe riding condition. Be sure the cables are routed correctly and properly adjusted.

Throttle Cable Lubrication

- Whenever the throttle cable is removed or in accordance with the Periodic Maintenance Chart, lubricate the these cables (see Chassis Parts Lubrication (2-59)).
- Apply a thin coating of grease to the cable upper end.
- Use a commercially available pressure cable lubricator to lubricate these cables.

Throttle Cable Inspection

- Refer to the Cable Inspection (see Chassis Parts Lubrication (2-59)).

3-108 FUEL SYSTEM (DFI)

Throttle Body Assy

Idle Speed Inspection

- Refer to the Idle Speed Inspection ([see Idle Speed Inspection\(2-17\)](#)).

Idle Speed Adjustment

- Refer to the Idle Speed Adjustment ([see Idle Speed Adjustment\(2-17\)](#)).

Throttle Bore Cleaning

- Check the throttle bore for cleanliness as follows.
 - Remove the throttle body assy ([see Throttle Body Assy Removal\(3-108\)](#)).
 - Check the throttle valve and throttle bore for carbon deposits by opening the throttle valve.
 - ★ If any carbon accumulates, wipe the carbon off the throttle bore around the throttle bore and the throttle valve, using a cotton pad penetrated with a high flash-point solvent.

Throttle Body Assy Removal

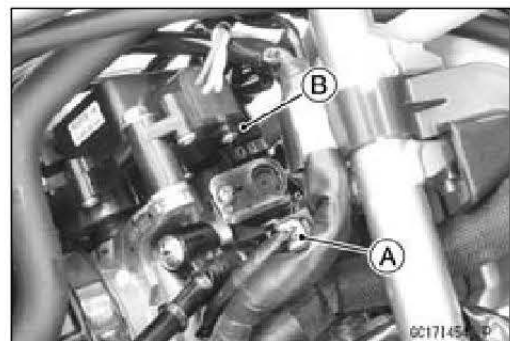
WARNING

Gasoline is extremely flammable and can be explosive under certain conditions, creating the potential for serious burns. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light. Do not smoke. Turn the ignition switch off. Be prepared for fuel spillage; any spilled fuel must be completely wiped up immediately.

NOTICE

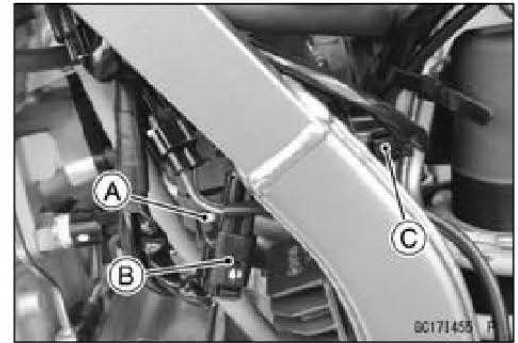
Never drop the throttle body assy especially on a hard surface. Such a shock to the body assy can damage it.

- Remove:
 - Fuel Tank ([see Fuel Tank Removal\(3-113\)](#))
 - Throttle Cable Lower Ends ([see Throttle Cable Replacement\(3-106\)](#))
 - Vehicle-down Sensor Bracket ([see Vehicle-down Sensor Removal\(3-62\)](#))
 - Fuel Hose ([see Fuel Hose Replacement\(2-22\)](#))
- Disconnect:
 - Fuel Injector Connector [A]
 - Intake Air Pressure Sensor Connector [B]



Throttle Body Assy

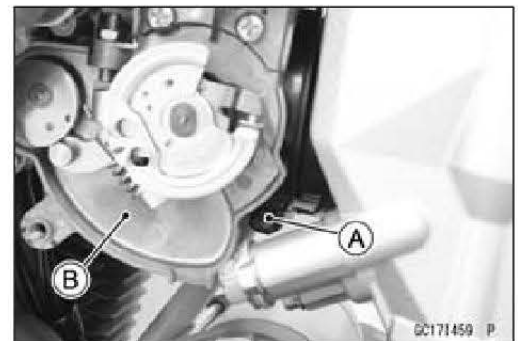
- Disconnect:
 - Main Throttle Sensor Connector [A]
 - Subthrottle Valve Actuator Lead Connector [B]
 - Subthrottle Sensor Connector [C]



- Loosen:
 - Air Cleaner Housing Clamp Screw [A]



- Loosen:
 - Throttle Body Assy Clamp Screw [A]
- Remove:
 - Throttle Body Assy [B]



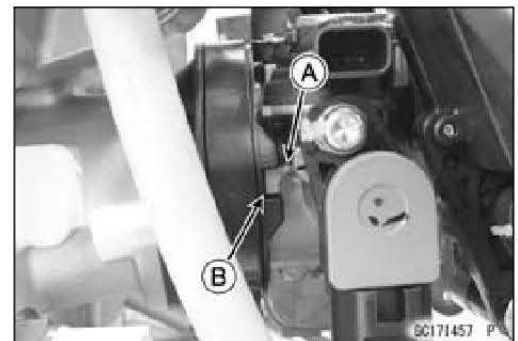
- After removing the throttle body assy, stuff pieces of lint-free, clean cloth into the throttle body assy holders.

NOTICE

If dirt gets into the engine, excessive engine wear and possible engine damage will occur.

Throttle Body Assy Installation

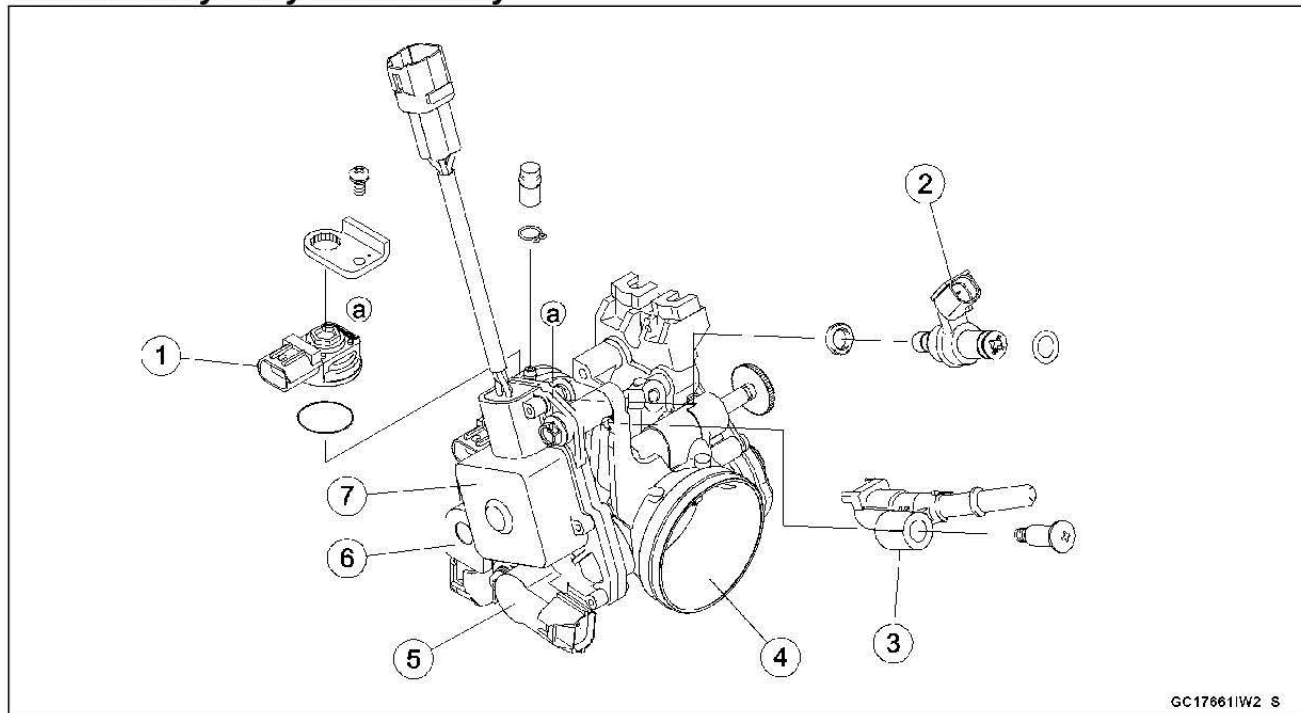
- Installation is the reverse of removal.
- Insert the rib [A] of the throttle body assy to the groove [B] on the throttle body assy holder.
- Tighten:
 - Torque - Throttle Body Assy Clamp Screw: 2.0 N·m (0.20 kgf·m, 18 in·lb)**
 - Air Cleaner Housing Clamp Screw: 2.0 N·m (0.20 kgf·m, 18 in·lb)**
- Adjust:
 - Throttle Grip Free Play (see Throttle Control System Inspection(2-18))



3-110 FUEL SYSTEM (DFI)

Throttle Body Assy

Throttle Body Assy Disassembly



GC176611W2 S

1. Intake Air Pressure Sensor (see Intake Air Pressure Sensor Removal(3-48))
2. Fuel Injector (see Fuel Injector Removal(3-74))
3. Delivery Pipe (see Fuel Injector Removal(3-74))
4. Throttle Body Assy
5. Subthrottle Sensor
6. Main Throttle Sensor
7. Subthrottle Valve Actuator

NOTICE

Do not remove, disassemble or adjust the main throttle sensor, subthrottle sensor, subthrottle valve actuator, throttle link mechanism and throttle body assy, because they are adjust or set surely at the manufacturer. Adjustment of these parts could result in poor performance, requiring replacement of the throttle body assy.

Throttle Body Assy Assembly

- Assembly is the reverse of disassembly.

Air Cleaner

Air Cleaner Element Removal/Installation

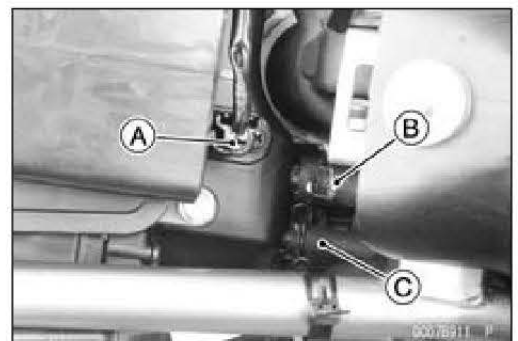
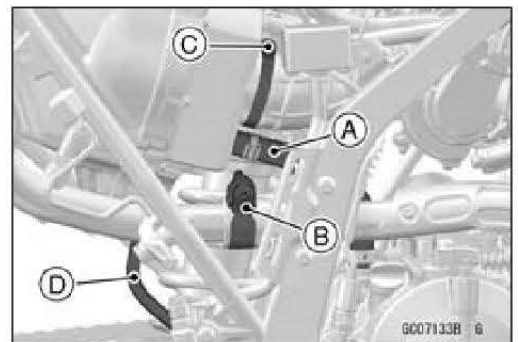
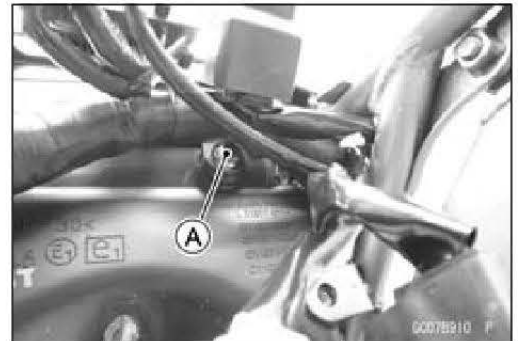
- Refer to the Air Cleaner Element Cleaning and Inspection (see Air Cleaner Element Cleaning and Inspection(2-15)).

Air Cleaner Element Inspection

- Refer to the Air Cleaner Element Cleaning and Inspection (see Air Cleaner Element Cleaning and Inspection(2-15)).

Air Cleaner Housing Removal

- Remove:
 - Side Covers (see Side Cover Removal(15-8))
 - Rear Fender (see Rear Fender Removal(15-11))
 - Mud Guard (see Mud Guard Removal(15-19))
 - ECU (see ECU Removal(3-93))
 - Air Cleaner Housing Mounting Bolt [A]
- Disconnect:
 - Breather Hose [A]
- Loosen the muffler clamp bolt [B], and move the clamp forward.
- Loosen the air cleaner duct clamp screw [C].
- Pull the air cleaner drain hose [D] out of the air cleaner housing.
- Disconnect:
 - Intake Air Temperature Sensor Connector [A]
 - Air Switching Valve Hose [B]
 - Hose (Green Point) [C] (Evaporative Emission Control System Equipped Models)
- Remove:
 - Rear Shock Absorber (see Rear Shock Absorber Removal(13-20))
- Remove the air cleaner housing [A] from the left side of the motorcycle.



3-112 FUEL SYSTEM (DFI)

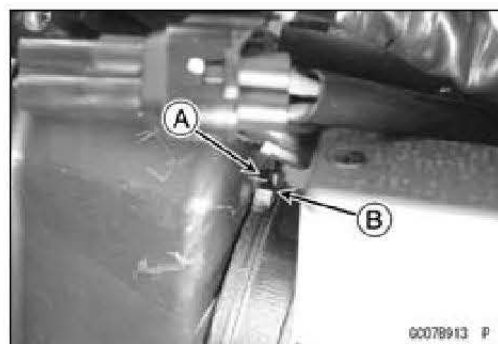
Air Cleaner

Air Cleaner Housing Installation

- Fit the projection [A] of the air cleaner housing into the groove [B] of the air cleaner duct.
- Tighten the clamp screw securely.
- Run the removed hoses properly (see Cable, Wire, and Hose Routing section (17-2)).
- Tighten:

Torque - Air Cleaner Housing Clamp Bolt: 2.0 N·m (0.20 kgf·m, 18 in·lb)

Air Cleaner Housing Mounting Bolt: 6.9 N·m (0.70 kgf·m, 61 in·lb)



Fuel Tank

Fuel Tank Removal

WARNING

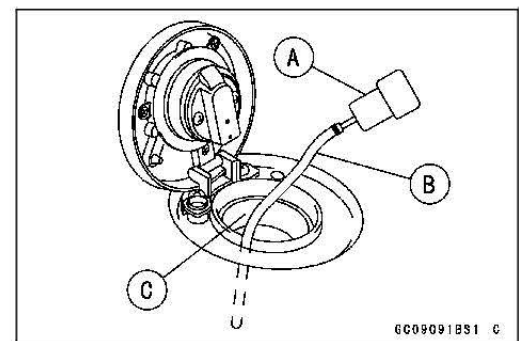
Gasoline is extremely flammable and can be explosive under certain conditions, creating the potential for serious burns. Make sure the area is well-ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light. Do not smoke. Turn the ignition switch OFF. Disconnect the battery (–) terminal. To avoid fuel spills, draw it from the tank when the engine is cold. Be prepared for fuel spillage; any spilled fuel must be completely wiped up immediately.

- Turn the ignition switch off.
- Wait until the engine cools down.
- Disconnect the battery (–) terminal (see [Battery Removal\(16-20\)](#)).
- Remove:
 - Shrouds (see [Shroud Removal\(15-10\)](#))
 - Seat (see [Seat Removal \(15-7\)](#))
 - Fuel Tank Bolts [A]
- Draw the fuel out from the fuel tank with a commercially available pump [A].
- Use a soft plastic hose [B] as a pump intake hose in order to insert the hose smoothly.
- Put the hose through the fill opening [C] into the tank and draw the fuel out.

WARNING

Spilled fuel is flammable and can be explosive under certain conditions. The fuel can not be removed completely from the fuel tank. Be careful for remained fuel spillage.

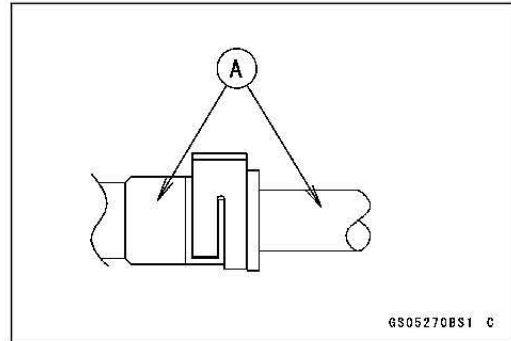
- Disconnect:
 - Fuel Pump Lead Connector [A]



3-114 FUEL SYSTEM (DFI)

Fuel Tank

- Lift the fuel tank up for disconnect the fuel hose.
- Be sure to place a piece of cloth around the fuel hose joint.
- Wipe off the dirt of the surface [A] around the connection using a cloth or a soft brush.

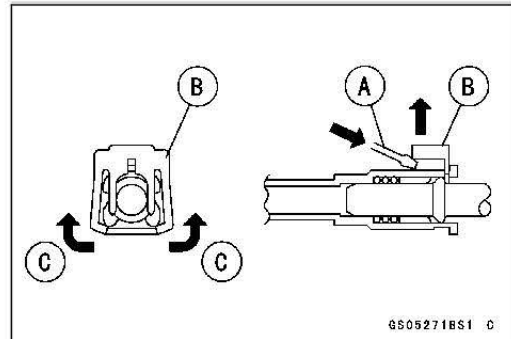


When removing with flat tip screwdriver

- Insert the flat tip screwdriver [A] into the slit [B] on the joint lock.
- Turn the driver to disconnect the joint lock.

When removing with fingers

- Open and push up [C] the joint lock with your fingers.



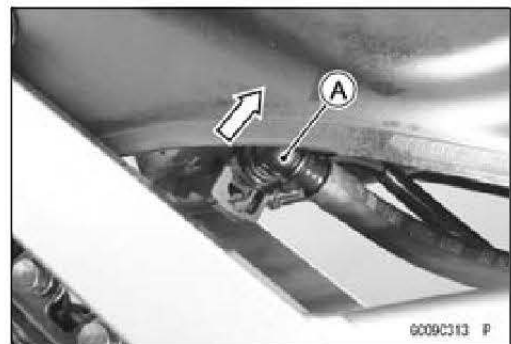
NOTICE

Prying or excessively widening the joint lock ends for fuel hose removal will permanently deform the joint lock, resulting in a loose or incomplete lock that may allow fuel to leak and create the potential for a fire explosion. To prevent fire or explosion from a damaged joint lock, do not pry or excessively widen the joint lock ends when removing the fuel hose. The joint lock has a retaining edge that locks around the housing.

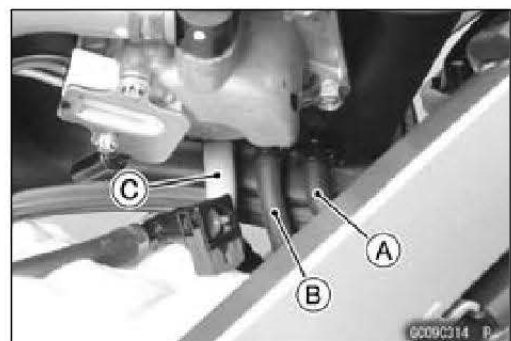
- Pull the fuel hose joint [A] out of the fuel outlet pipe.

⚠ WARNING

Fuel is flammable and explosive under certain conditions and can cause severe burns. Be prepared for fuel spillage; any spilled fuel must be completely wiped up immediately. When the fuel hose is disconnected, fuel spills out from the hose and the pipe because of residual pressure. Cover the hose connection with a piece of clean cloth to prevent fuel spillage.



- Disconnect:
 - Fuel Tank Breather Hose [A]
 - Fuel Return Hose [B] (Evaporative Emission Control System Equipped Model)
 - Fuel Tank Drain Hose [C]



Fuel Tank

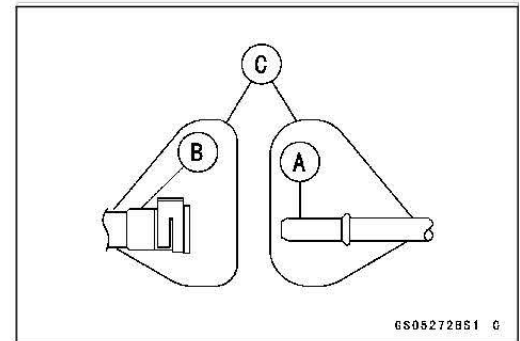
- Close the fuel tank cap.
- Remove the fuel tank, and place it on a flat surface.
- Do not apply the load to the fuel outlet pipe of the fuel pump.



WARNING

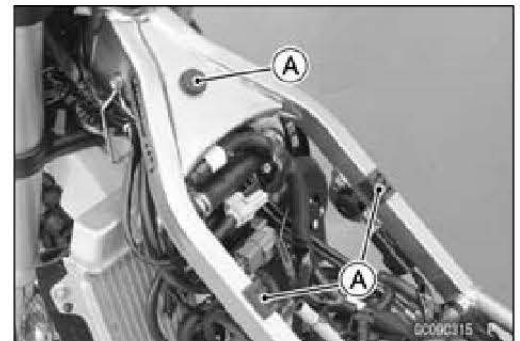
Gasoline is extremely flammable and can be explosive under certain conditions, creating the potential for serious burns. Store the fuel tank in an area which is well-ventilated and free from any source of flame or sparks. Do not smoke in this area. Place the fuel tank on a flat surface and plug the fuel pipes to prevent fuel leakage.

- Clean the pipe [A].
- Cover the pipe and hose joint [B] with the vinyl bags [C] to keep them clean.



Fuel Tank Installation

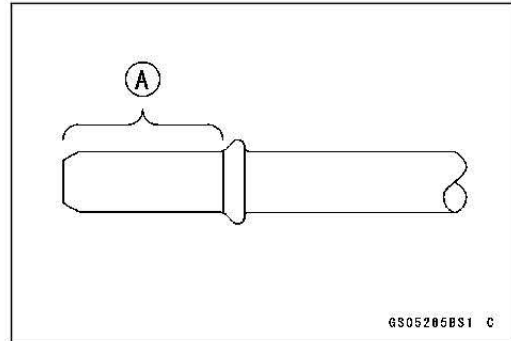
- Note the above WARNING (see Fuel Tank Removal(3-113)).
- Run the hoses correctly (see Cable, Wire, and Hose Routing section (17-2)).
- Check that the dampers [A] are in place on the frame.
- ★ If the dampers are damaged or deteriorated, replace them.
- Using a high flash-point solvent, clean off any oil or dirt that may be on the adhesive coating area. Dry them with a clean cloth.
- ★ If necessary, apply adhesive to the underside of the dampers, and stick them.
- Check the trims [A] are in place on the fuel tank.
- ★ If the trims are damaged or deteriorated, replace them.



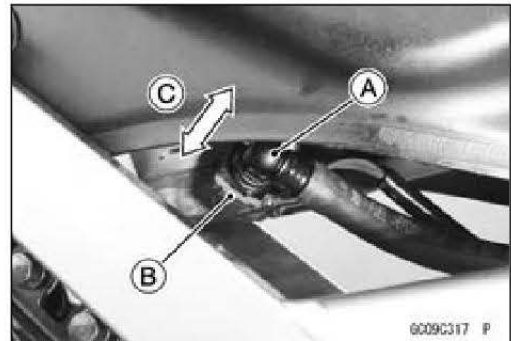
3-116 FUEL SYSTEM (DFI)

Fuel Tank

- Remove the vinyl bags on the pipe and hose joint.
- Check that there are no flaws, burrs, and adhesion of foreign materials on fuel outlet pipe [A].
- Check the joint lock for deformation and wear.
- ★ If the joint lock is deformed, replace the fuel hose with a new one.
- Apply small amount of engine oil to the fuel outlet pipe lightly.



- Insert the fuel hose joint [A] straight onto the fuel outlet pipe until the hose joint clicks.
- Push the joint lock [B].
- Push and pull [C] the fuel hose joint back and forth more than two times, and make sure it is locked and does not come off.



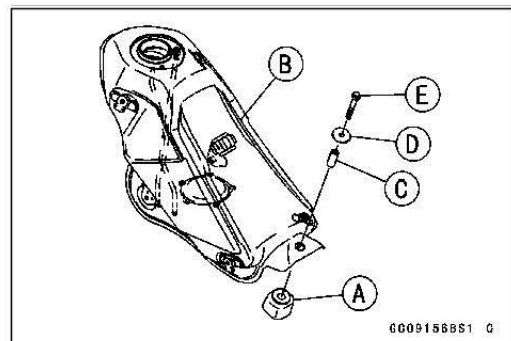
WARNING

Leaking fuel can cause a fire or explosion resulting in serious burns. Make sure the hose joint is installed correctly on the delivery pipe by sliding the joint.

- ★ If it comes off, reinstall the hose joint.
- Connect:
 - Fuel Tank Drain Hose
 - Fuel Return Hose (Evaporative Emission Control System Equipped Model)
 - Fuel Tank Breather Hose

- Install:
 - Damper [A]
 - Fuel Tank [B]
 - Collar [C]
 - Washer [D]
 - Fuel Tank Bolt [E]

Torque - Fuel Tank Bolt: 7.0 N·m (0.71 kgf·m, 62 in·lb)

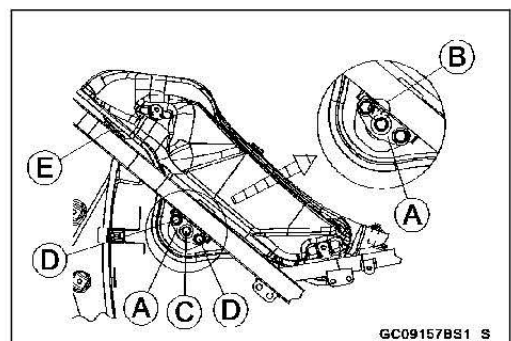


- Install (Both Sides):
 - Bracket [A] (make sure that marked arrow [B] of direction)
 - Damper
 - Fuel Tank Bolt [C] with Collar

Torque - Fuel Tank Bolt: 7.0 N·m (0.71 kgf·m, 62 in·lb)

- Install the fuel tank bracket bolts [D] with washers temporary (both sides).
- While pushing the fuel tank to the damper [E], tighten the fuel tank bracket bolts.

Torque - Fuel Tank Bracket Bolts: 7.0 N·m (0.71 kgf·m, 62 in·lb)

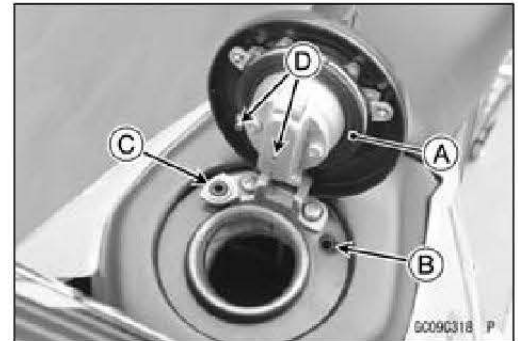


- Connect the fuel pump lead connector.
- Install the removed parts.

Fuel Tank

Fuel Tank Inspection

- Open the tank cap.
- Visually inspect the gasket [A] on the tank cap for any damage.
- ★ If gasket is damaged, replace the tank cap with a new one.
- Check to see if the water drain pipe [B] and fuel breather pipe [C] in the tank are not clogged. Check the tank cap breather also.
- ★ If they are clogged, remove the tank and drain it, and then blow the breather free with compressed air.



NOTICE

Do not apply compressed air to the air vent holes [D] in the tank cap. This could cause damage and clogging of the labyrinth in the cap.

Fuel Tank Cleaning

WARNING

Gasoline and low flash-point solvents can be flammable and/or explosive and cause severe burns. Clean the tank in a well-ventilated area, and take care that there are no sparks or flame anywhere near the working area. Do not use gasoline or low flash-point solvents to clean the tank.

- Remove:
 - Fuel Tank (see Fuel Tank Removal(3-113))
 - Fuel Hose (see Fuel Hose Replacement(2-22))
 - Fuel Pump (see Fuel Pump Removal(3-101))
- Pour some high flash-point solvent into the fuel tank and shake the tank to remove dirt and fuel deposits.
- Draw the solvent out of the fuel tank.
- Dry the tank with compressed air.
- Install:
 - Fuel Pump (see Fuel Pump Installation(3-102))
 - Fuel Hose (see Fuel Hose Replacement(2-22))
 - Fuel Tank (see Fuel Tank Installation(3-115))

3-118 FUEL SYSTEM (DFI)

Evaporative Emission Control System (CAL Model)

The Evaporative Emission Control System routes fuel vapors from the fuel system into the running engine or stores the vapors in a canister when the engine is stopped. Although no adjustments are required, a thorough visual inspection must be made at the intervals specified by the Periodic Maintenance Chart.

Parts Removal/Installation



WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch off. Do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

NOTICE

If gasoline, solvent, water or any other liquid enters the canister, the canister's vapor absorbing capacity is greatly reduced. If the canister does become contaminated, replace it with a new one.

- To prevent the gasoline from flowing into or out of the canister, hold the separator perpendicular to the ground.
- Run the hoses correctly (see Cable, Wire, and Hose Routing section (17-2)).
- Make sure they do not get pinched or kinked.

Hose Inspection

- Refer to the Evaporative Emission Control System Inspection (see Evaporative Emission Control System Inspection (CAL Model)(2-24)).

Separator Inspection

- Refer to the Evaporative Emission Control System Inspection (see Evaporative Emission Control System Inspection (CAL Model)(2-24)).

Canister Inspection

- Refer to the Evaporative Emission Control System Inspection (see Evaporative Emission Control System Inspection (CAL Model)(2-24)).

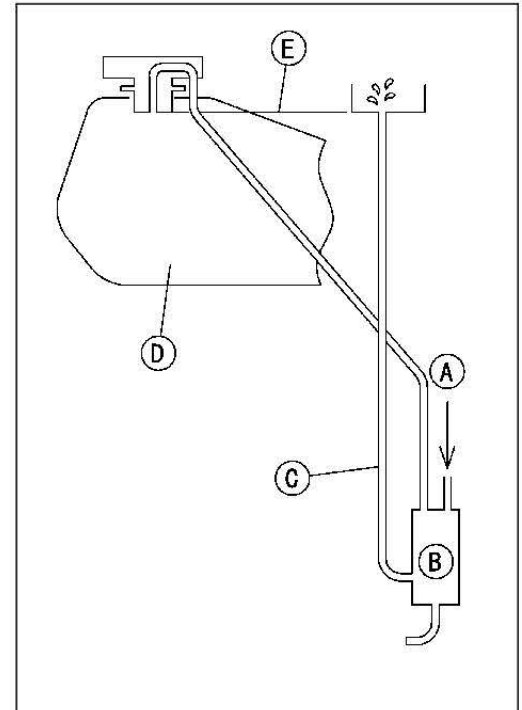
Evaporative Emission Control System (CAL Model)

Separator Operation Test

⚠ WARNING

Gasoline is extremely flammable and can be explosive under certain conditions. Turn the ignition switch off. Do not smoke. Make sure the area is well ventilated and free from any source of flame or sparks; this includes any appliance with a pilot light.

- Connect the hoses to the separator, and install the separator on the motorcycle.
- Disconnect the breather hose from the separator, and inject about 20 mL (0.68 US oz.) of gasoline [A] into the separator [B] through the hose fitting.
- Disconnect the fuel return hose [C] from the fuel tank [D].
- Run the open end of the return hose into the container and hold it level with the tank top [E].
- Start the engine, and let it idle.
- ★ If the gasoline in the separator comes out of the hose, the separator works well. If it does not, replace the separator with a new one.



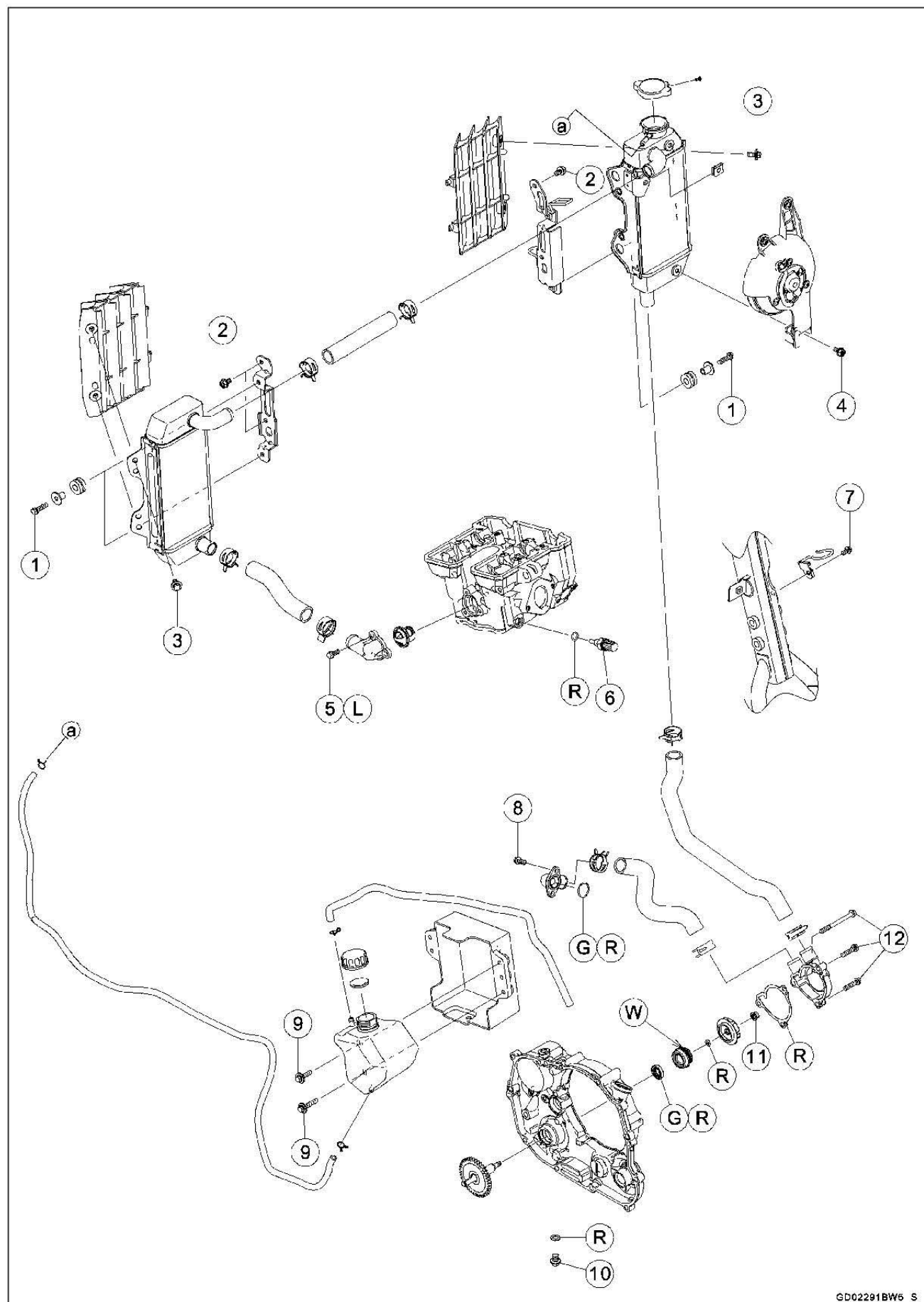
Cooling System

Table of Contents

Exploded View.....	4-2
Coolant Flow Chart.....	4-4
Specifications	4-7
Special Tools	4-8
Coolant	4-9
Coolant Deterioration Inspection.....	4-9
Coolant Level Inspection.....	4-9
Coolant Draining	4-9
Coolant Filling	4-9
Pressure Testing	4-9
Cooling System Flushing	4-10
Coolant Reserve Tank Removal	4-10
Coolant Reserve Tank Installation	4-10
Water Pump.....	4-11
Water Pump Removal.....	4-11
Water Pump Installation	4-11
Water Pump Inspection.....	4-12
Water Pump Impeller Inspection.....	4-12
Mechanical Seal Replacement	4-12
Mechanical Seal Inspection	4-14
Radiator.....	4-15
Radiator Removal	4-15
Radiator Installation	4-16
Radiator Inspection	4-17
Radiator Cap Inspection	4-17
Radiator Filler Neck Inspection	4-18
Thermostat	4-19
Thermostat Removal.....	4-19
Thermostat Installation.....	4-19
Thermostat Inspection	4-19
Hoses	4-20
Hose Installation	4-20
Hose Inspection	4-20
Water Temperature Sensor	4-21
Water Temperature Sensor Removal.....	4-21
Water Temperature Sensor Installation.....	4-21
Water Temperature Sensor Inspection	4-21

4-2 COOLING SYSTEM

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Radiator Bolts	6.9	0.70	61 in·lb	
2	Radiator Bracket Bolts	9.8	1.0	87 in·lb	
3	Radiator Screen Bolts	6.9	0.70	61 in·lb	
4	Radiator Fan Bolts	8.4	0.86	74 in·lb	
5	Thermostat Housing Bolts	12	1.2	106 in·lb	L
6	Water Temperature Sensor	12	1.2	106 in·lb	
7	Water Hose Bracket Bolt	9.8	1.0	87 in·lb	
8	Water Hose Fitting Bolts	9.8	1.0	87 in·lb	
9	Coolant Reserve Tank Bolts	6.9	0.70	61 in·lb	
10	Coolant Drain Bolt	25	2.5	18	
11	Water Pump Impeller Nut	7.8	0.80	69 in·lb	
12	Water Pump Cover Bolts	9.8	1.0	87 in·lb	

G: Apply grease.

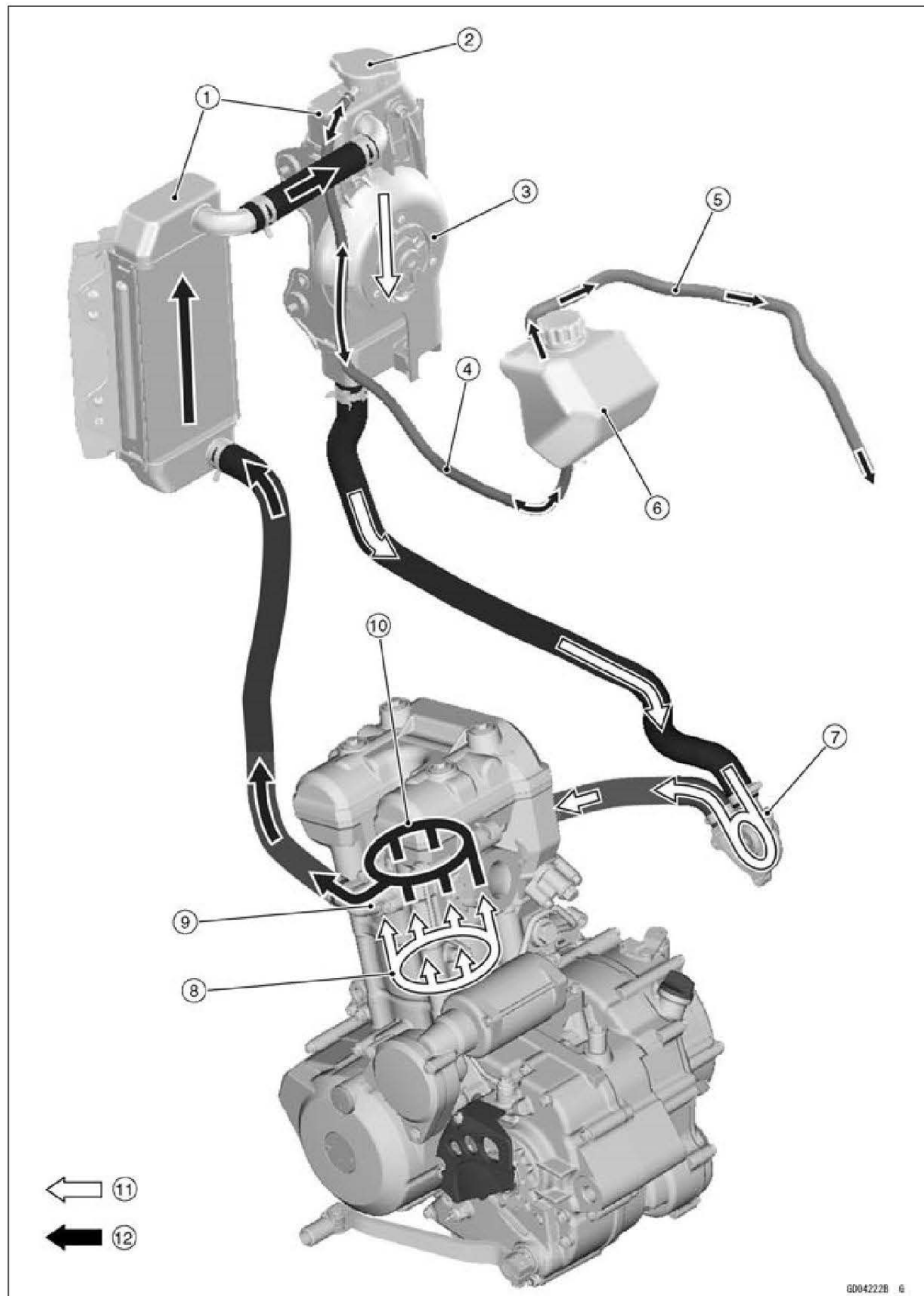
L: Apply a non-permanent locking agent.

R: Replacement Parts

W: Apply water.

4-4 COOLING SYSTEM

Coolant Flow Chart



Coolant Flow Chart

1. Radiators
2. Radiator Cap
3. Radiator Fan
4. Radiator Overflow Hose
5. Reserve Tank Overflow Hose
6. Reserve Tank
7. Water Pump
8. Cylinder Jacket
9. Thermostat Housing
10. Cylinder Head Jacket
11. Cold Coolant
12. Hot Coolant

4-6 COOLING SYSTEM

Coolant Flow Chart

Permanent type antifreeze is used as a coolant to protect the cooling system from rust and corrosion. When the engine starts, the water pump turns and the coolant circulates.

The thermostat is a wax pellet type which opens or closes with coolant temperature changes. The thermostat continuously changes its valve opening to keep the coolant temperature at the proper level. When coolant temperature is less than 69.5 ~ 72.5°C (157 ~ 163°F), the thermostat closes so that the coolant flow is restricted through the air bleeder hole, causing the engine to warm up more quickly. When coolant temperature is more than 69.5 ~ 72.5°C (157 ~ 163°F), the thermostat opens and the coolant flows.

When the coolant temperature goes up beyond 98°C (208°F), the radiator fan relay conducts to operate the radiator fan. The radiator fan draws air through the radiator core when there is not sufficient air flow such as at low speeds. This increases up the cooling action of the radiator. When the coolant temperature is below 95°C (203°F), the fan relay opens and the radiator fan stops.

In this way, this system controls the engine temperature within narrow limits where the engine operates most efficiently even if the engine load varies.

The system is pressurized by the radiator cap to suppress boiling and the resultant air bubbles which can cause engine overheating. As the engine warms up, the coolant in the radiator and the water jacket expands. The excess coolant flows through the radiator cap and hose to the reserve tank to be stored there temporarily. Conversely, as the engine cools down, the coolant in the radiator and the water jacket contracts, and the stored coolant flows back to the radiator from the reserve tank.

The radiator cap has two valves. One is a pressure valve which holds the pressure in the system when the engine is running. When the pressure exceeds 107.9 ~ 137.3 kPa (1.10 ~ 1.40 kgf/cm², 15.6 ~ 19.9 psi), the pressure valve opens and releases the pressure to the reserve tank. As soon as pressure escapes, the valve closes, and keeps the pressure at 107.9 ~ 137.3 kPa (1.10 ~ 1.40 kgf/cm², 15.6 ~ 19.9 psi). When the engine cools down, another small valve (vacuum valve) in the cap opens. As the coolant cools, the coolant contracts to form a vacuum in the system. The vacuum valve opens and allows the coolant from the reserve tank to enter the radiator.

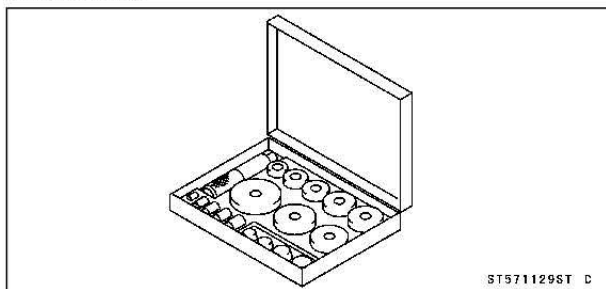
Specifications

Item	Standard
Coolant Provided when Shipping	
Type (Recommended)	Permanent type of antifreeze (soft water and ethylene glycol plus corrosion and rust inhibitor chemicals for aluminum engines and radiators)
Color	Green
Mixed Ratio	Soft water 50%, coolant 50%
Freezing Point	−35°C (−31°F)
Total Amount	1.2 L (1.3 US qt) (Reserve tank full level, including radiator and engine)
Radiator Cap	
Relief Pressure	107.9 ~ 137.3 kPa (1.10 ~ 1.40 kgf/cm ² , 15.6 ~ 19.9 psi)
Thermostat	
Valve Opening Temperature	69.5 ~ 72.5°C (157 ~ 162°F)
Valve Full Opening Lift	3 mm (0.12 in.) or more @85°C (185°F)

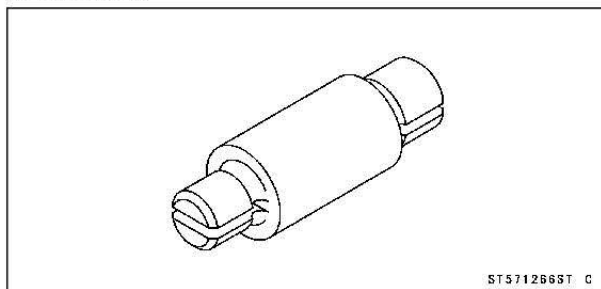
4-8 COOLING SYSTEM

Special Tools

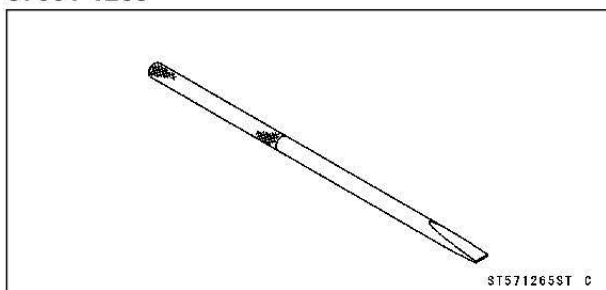
**Bearing Driver Set:
57001-1129**



**Bearing Remover Head, $\phi 10 \times \phi 12$:
57001-1266**



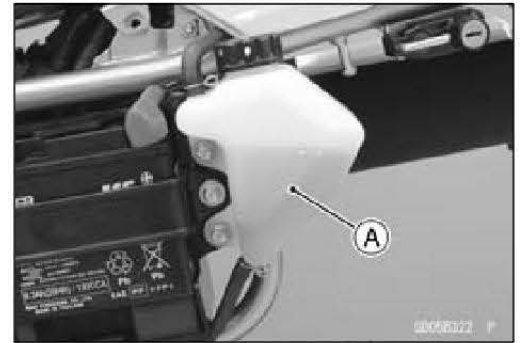
**Bearing Remover Shaft, $\phi 9$:
57001-1265**



Coolant

Coolant Deterioration Inspection

- Remove the left side cover (see Side Cover Removal(15-8)).
- Visually inspect the coolant in the reserve tank [A].
- ★ If whitish cotton-like wafts are observed, aluminum parts in the cooling system are corroded. If the coolant is brown, iron or steel parts are rusting. In either case, flush the cooling system.
- ★ If the coolant gives off an abnormal smell, check for a cooling system leak. It may be caused by exhaust gas leaking into the cooling system.



Coolant Level Inspection

- Refer to the Coolant Level Inspection (see Coolant Level Inspection(2-25)).

Coolant Draining

- Refer to the Coolant Change (see Coolant Change(2-25)).

Coolant Filling

- Refer to the Coolant Change (see Coolant Change(2-25)).

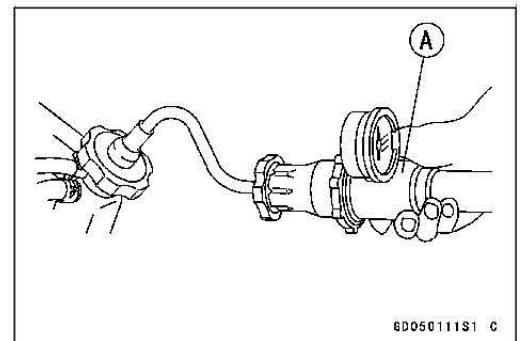
Pressure Testing

- Remove the radiator cap, and install a cooling system pressure tester [A] on the filler neck.

NOTE

○ Wet the cap sealing surfaces with water or coolant to prevent pressure leaks.

- Build up pressure in the system carefully until the pressure reaches 137.3 kPa (1.40 kgf/cm², 19.9 psi).



NOTICE

During pressure testing, do not exceed the pressure for which the system is designed. The maximum pressure is 137.3 kPa (1.40 kgf/cm², 19.9 psi).

- Watch the gauge for at least 6 seconds.
- ★ If the pressure holds steady, the system is all right.
- ★ If the pressure drops and no external source is found, check for internal leaks. Droplets in the engine oil indicate internal leakage. Check the cylinder head gasket and the water pump.
- Remove the pressure tester, replenish the coolant, and install the radiator cap.

4-10 COOLING SYSTEM

Coolant

Cooling System Flushing

Over a period of time, the cooling system accumulates rust, scale, and lime in the water jacket and radiator. When this accumulation is suspected or observed, flush the cooling system. If this accumulation is not removed, it will clog up the water passage and considerably reduce the efficiency of the cooling system.

- Drain the cooling system (see [Coolant Change\(2-25\)](#)).
- Fill the cooling system with fresh water mixed with a flushing compound.

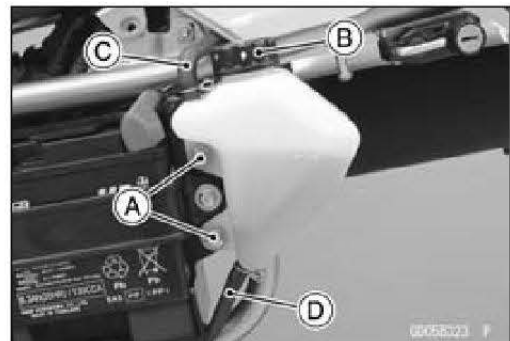
NOTICE

Do not use a flushing compound which is harmful to the aluminum engine and radiator. Carefully follow the instructions supplied by the manufacturer of the cleaning product.

- Warm up the engine, and run it at normal operating temperature for about ten minutes.
- Stop the engine, and drain the cooling system.
- Fill the system with fresh water.
- Warm up the engine and drain the system.
- Repeat the previous two steps once more.
- Fill the system with a permanent type coolant and bleed the air from the system (see [Coolant Change\(2-25\)](#)).

Coolant Reserve Tank Removal

- Remove:
 - Left Side Cover (see [Side Cover Removal\(15-8\)](#))
 - Reserve Tank Bolts [A]
 - Cap [B]
- Disconnect:
 - Reserve Tank Overflow Hose [C]
- Pour the coolant into a container.
- Slide the clamp, and disconnect the radiator overflow hose [D].



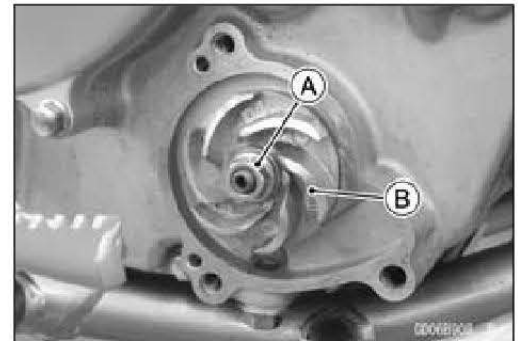
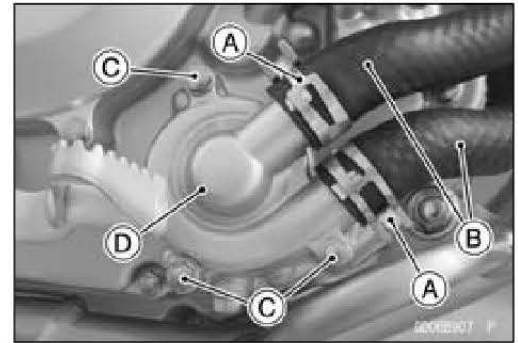
Coolant Reserve Tank Installation

- Installation is the reverse of removal.
- Run the hoses correctly (see [Cable, Wire, and Hose Routing section \(17-2\)](#)).
- Tighten:
 - Torque - Coolant Reserve Tank Bolts: 6.9 N·m (0.70 kgf·m, 61 in·lb)**
- Fill the coolant reserve tank with the coolant (see [Coolant Change\(2-25\)](#)).

Water Pump

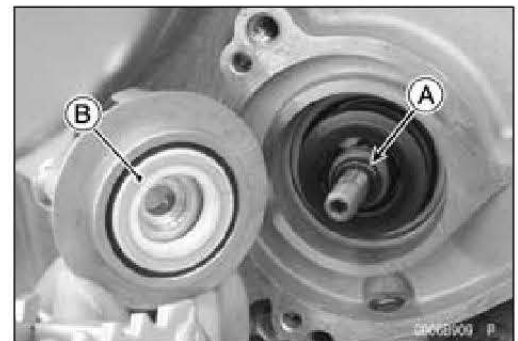
Water Pump Removal

- Drain:
Coolant (see [Coolant Change\(2-25\)](#))
- Slide clamps [A], and disconnect the water hoses [B].
- Remove:
Water Pump Cover Bolts [C]
Water Pump Cover [D]
- Remove:
Water Pump Impeller Nut [A]
Water Pump Impeller [B]

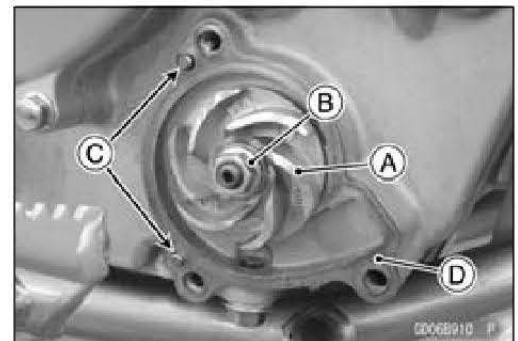


Water Pump Installation

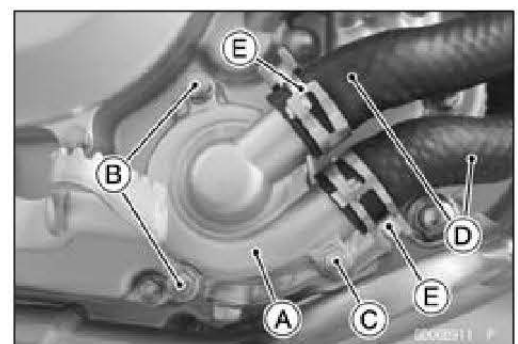
- Replace the O-ring [A] with a new one, and install it.
- Apply water to the sealing surface of the sealing seat [B].



- Install:
Water Pump Impeller [A]
- Tighten:
Torque - Water Pump Impeller Nut [B]: 7.8 N·m (0.80 kgf·m, 69 in·lb)
- Be sure to install the dowel pins [C].
- Replace the gasket [D] with a new one, and install it.



- Install:
Water Pump Cover [A]
- Install the water pump cover bolts.
L = 25 mm (1.0 in.) [B]
L = 65 mm (2.6 in.) [C]
- Tighten:
Torque - Water Pump Cover Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)
- Install the water hoses [D] and clamps [E] (see [Cable, Wire, and Hose Routing section \(17-2\)](#)).
- Pour in the coolant (see [Coolant Change\(2-25\)](#)).

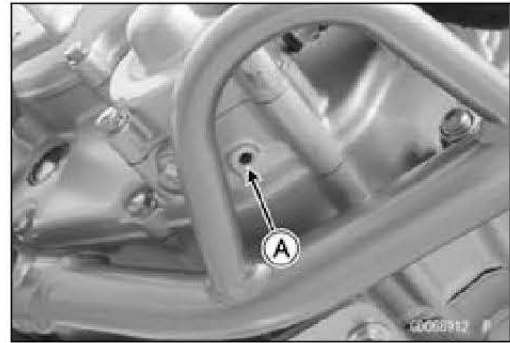


4-12 COOLING SYSTEM

Water Pump

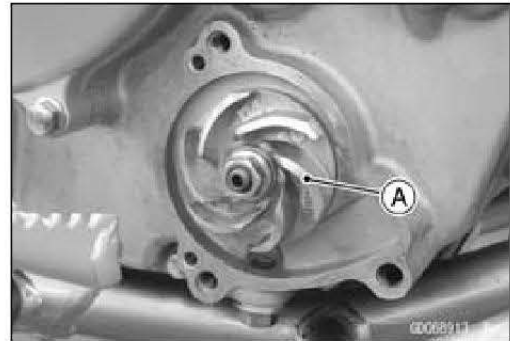
Water Pump Inspection

- Check the drainage outlet passage [A] at the bottom of the right engine cover for coolant leaks.
- If a coolant leak or ooze is found, start the engine and check if the coolant leaks continuously.
- When coolant does not continuously leak, it is normal.
- ★ If the mechanical seal is damaged, the coolant continuously leaks through the drainage outlet passage. Replace the mechanical seal unit.
- ★ If the oil seal is damaged, engine oil leaks through the drainage outlet passage. Replace the oil seal.



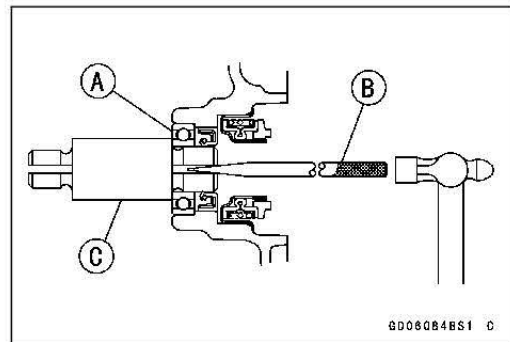
Water Pump Impeller Inspection

- Remove the water pump cover (see Water Pump Removal(4-11)).
- Visually inspect the water pump impeller [A].
- ★ If the surface is corroded or if the blades are damaged, replace the water pump impeller with a new one.



Mechanical Seal Replacement

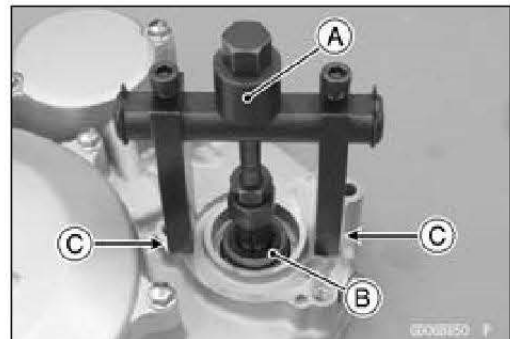
- Remove:
 - Right Engine Cover (see Right Engine Cover Removal(6-9))
 - Ball Bearing [A]
- Special Tools - Bearing Remover Shaft, $\phi 9$ [B]: 57001-1265**
Bearing Remover Head, $\phi 10 \times \phi 12$ [C]: 57001-1266



- Using a suitable bearing remover [A], remove the mechanical seal [B].
- Place suitable dampers [C] under the bearing remover to protect the right engine cover.
- Using the bearing driver set, press out the oil seal.

Special Tool - Bearing Driver Set: 57001-1129

- Replace the ball bearing, oil seal and mechanical seal with new ones.



NOTICE

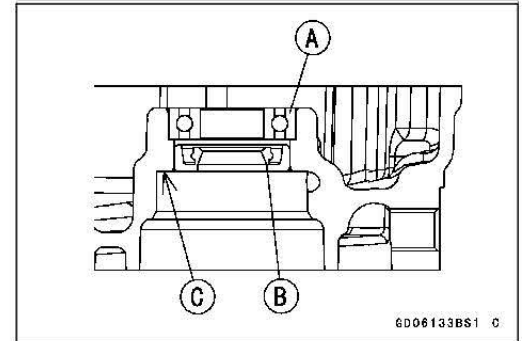
Do not reuse the mechanical seal, ball bearing and oil seal.

Water Pump

- Press the new ball bearing [A] until it is bottomed.
- Press the new oil seal [B] so that its surface is flush with the end of the hole [C].

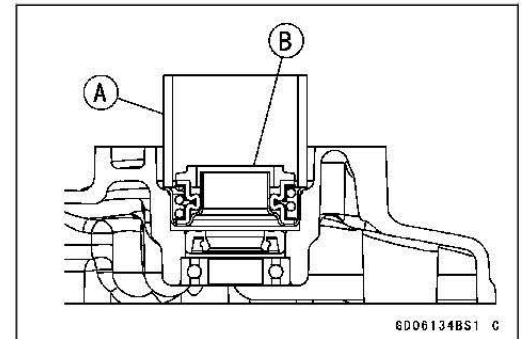
Special Tool - Bearing Driver Set: 57001-1129

- Apply grease to the oil seal lips.

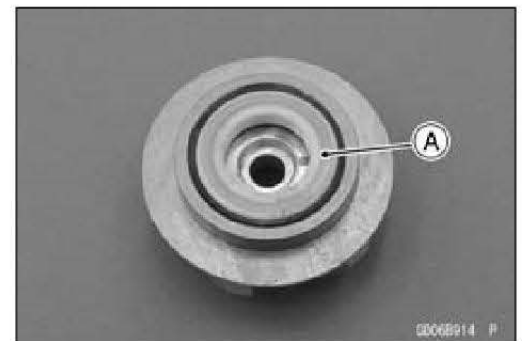


- Using a suitable tool [A] [inside diameter: 28 mm (1.10 in.), outside diameter: 32 mm (1.26 in.)] and the bearing driver set, press the new mechanical seal [B] until its flange touches the right engine cover.

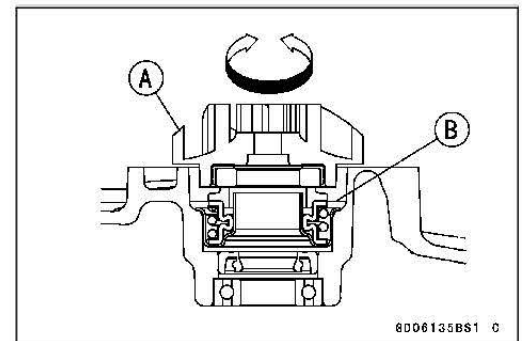
Special Tool - Bearing Driver Set: 57001-1129



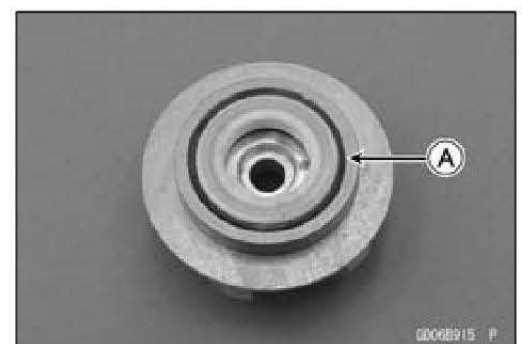
- Apply water to the rubber side of the seal [A].
- Install the seal to the impeller with the ceramic side facing outward.
- Clean the seal surface and apply soap and water solution to it.



- Push the impeller [A] against the mechanical seal [B] and turn it by hand.



- Check that the black impression [A] appears evenly on the rubber seal of impeller.
- Install the removed parts.

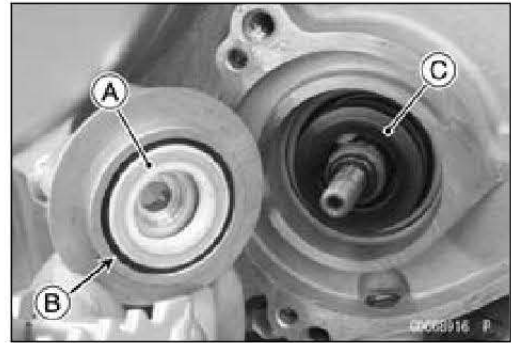


4-14 COOLING SYSTEM

Water Pump

Mechanical Seal Inspection

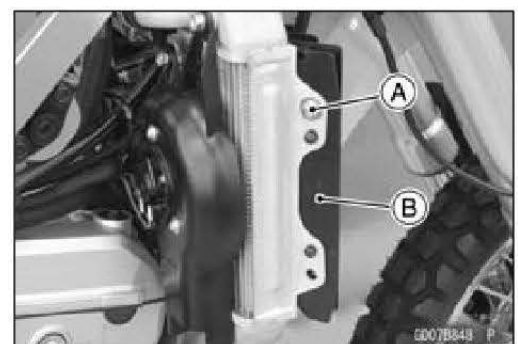
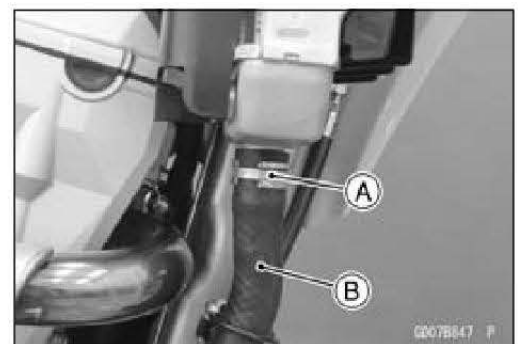
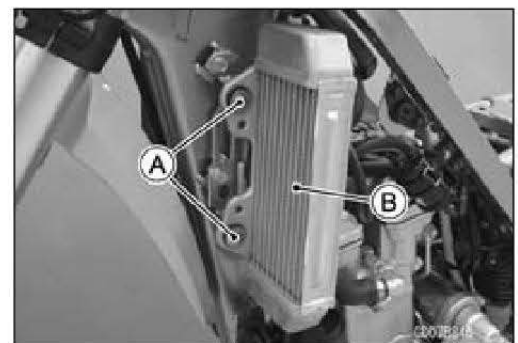
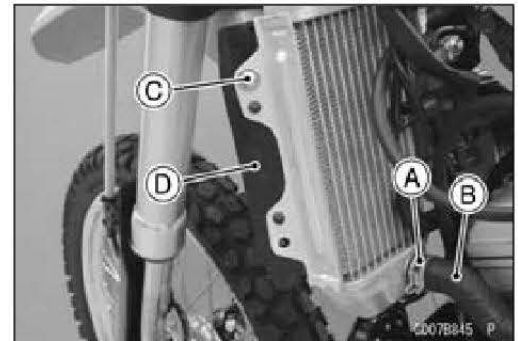
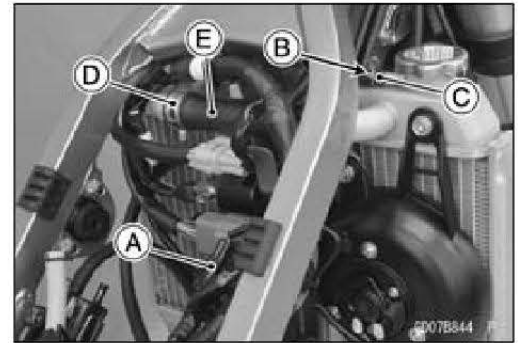
- Remove the water pump impeller (see Water Pump Removal(4-11)).
- Visually inspect the mechanical seal.
- ★ If any one of the parts is damaged, replace the mechanical seal as a unit.
 - Impeller Sealing Seat Surface [A]
 - Rubber Seal [B]
 - Mechanical Seal [C]



Radiator

Radiator Removal

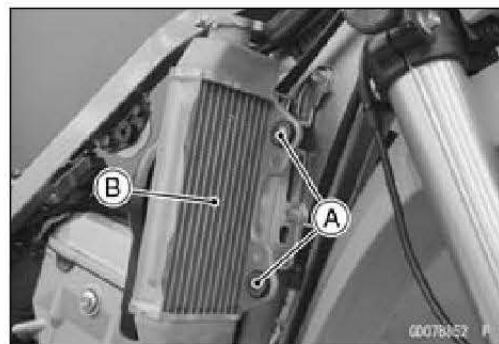
- Drain:
Coolant (see Coolant Change(2-25))
- Remove:
Fuel Tank (see Fuel Tank Removal(3-113))
- Disconnect:
Radiator Fan Motor Lead Connector [A]
- Slide the clamp [B], and disconnect the radiator overflow hose [C].
- Slide the clamp [D], and disconnect the water hose [E].
- Slide the clamp [A], and disconnect the water hose [B].
- Remove:
Radiator Screen Bolt [C]
Radiator Screen [D]
- Remove:
Radiator Bolts [A]
Left Radiator [B]
- Slide the clamp [A], and disconnect the water hose [B].
- Remove:
Radiator Screen Bolt [A]
Radiator Screen [B]



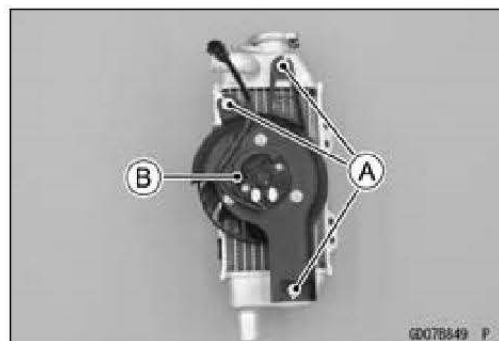
4-16 COOLING SYSTEM

Radiator

- Remove:
Radiator Bolts [A]
Right Radiator [B]

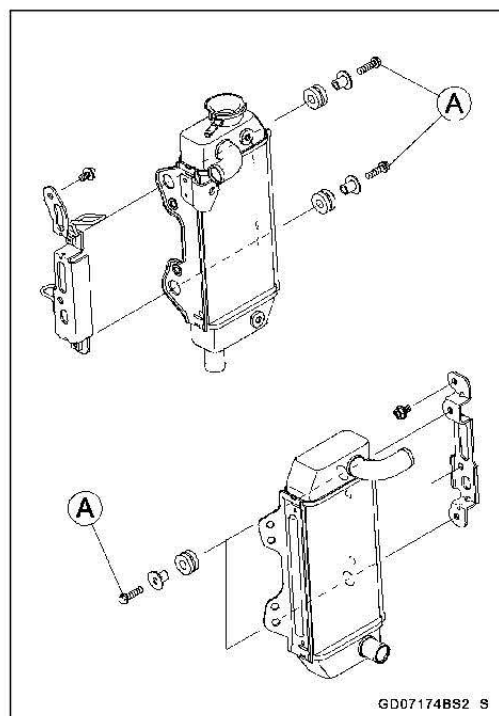


- Remove:
Radiator Fan Bolts [A]
Radiator Fan [B]

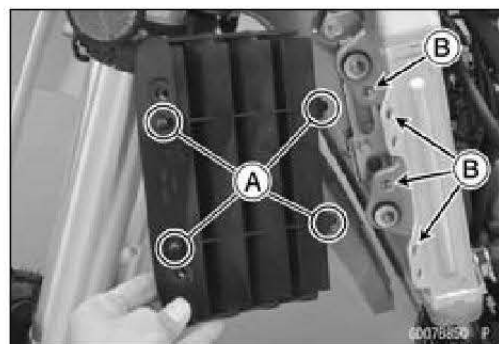


Radiator Installation

- Installation is the reverse of removal.
- Tighten:
Torque - Radiator Bolt [A]: 6.9 N·m (0.70 kgf·m, 61 in·lb)
- Run the lead and hoses correctly (see Cable, Wire, and Hose Routing section (17-2)).



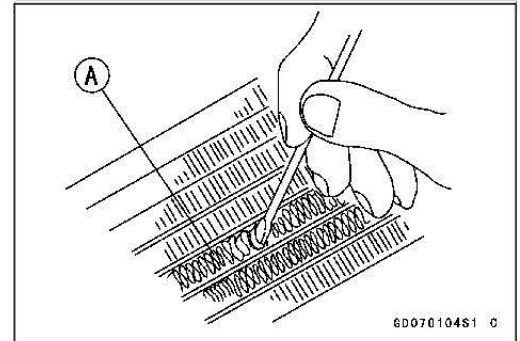
- Install the radiator screens on both sides.
○ Fit the projections [A] and the holes [B].
- Tighten:
Torque - Radiator Screen Bolts: 6.9 N·m (0.70 kgf·m, 61 in·lb)
- Fill the coolant (see Coolant Change(2-25)).
- Install the removed parts.



Radiator

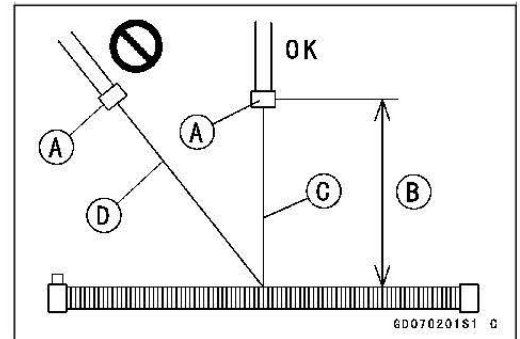
Radiator Inspection

- Remove the radiator (see Radiator Removal(4-15)).
- Check the radiator core.
- ★ If there are obstructions to air flow, remove them.
- ★ If the corrugated fins [A] are deformed, carefully straighten them.
- ★ If the air passages of the radiator core are blocked more than 20% by unremovable obstructions or irreparably deformed fins, replace the radiator with a new one.



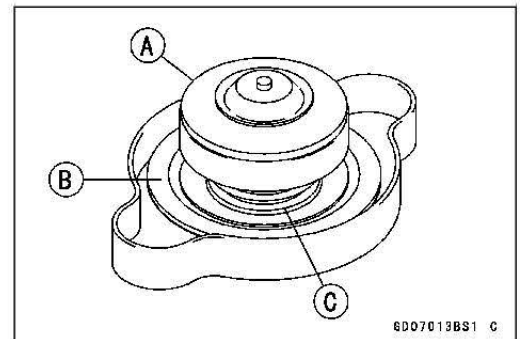
NOTICE

When cleaning the radiator with steam cleaner, be careful of the following to prevent radiator damage:
 Keep the steam gun [A] away more than 0.5 m (1.6 ft) [B] from the radiator core.
 Hold the steam gun perpendicular [C] (not oblique [D]) to the core surface.
 Run the steam gun, following the core fin direction.



Radiator Cap Inspection

- Remove:
 Radiator Cap
- Check the condition of the bottom [A] and top [B] valve seals and valve spring [C].
- ★ If any one of them shows visible damage, replace the cap with a new one.



- Install the cap [A] on a cooling system pressure tester [B].

NOTE

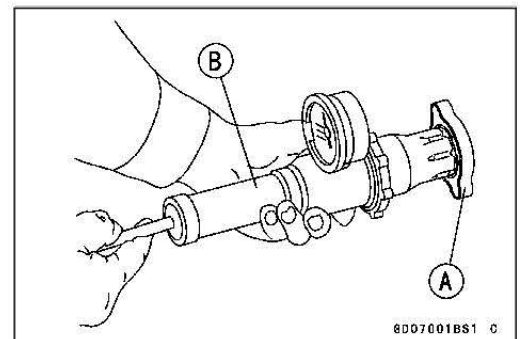
○ Wet the cap sealing surfaces with water or coolant to prevent pressure leaks.

- Watching the pressure gauge, pump the pressure tester to build up the pressure until the relief valve opens: the gauge needle flicks downward. Stop pumping and measure leak time at once. The relief valve must open within the specified range in the table below and the gauge hand must remain within the same range at least 6 seconds.

Radiator Cap Relief Pressure

Standard: 107.9 ~ 137.3 kPa (1.10 ~ 1.40 kgf/cm², 15.6 ~ 19.9 psi)

- ★ If the cap can not hold the specified pressure or if it holds too much pressure, replace it with a new one.

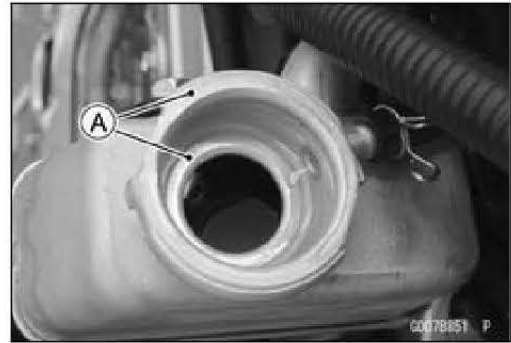


4-18 COOLING SYSTEM

Radiator

Radiator Filler Neck Inspection

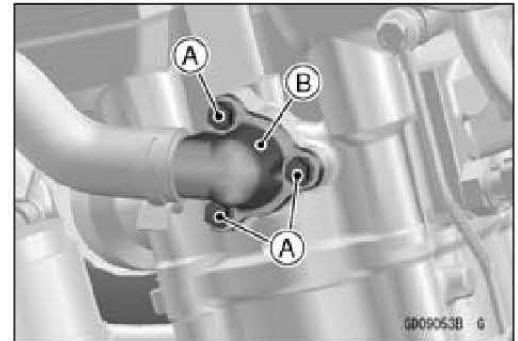
- Remove:
 - Radiator Cap
- Check the radiator filler neck for signs of damage.
- Check the condition of the top and bottom sealing seats [A] in the filler neck. They must be smooth and clean for the radiator cap to function properly.



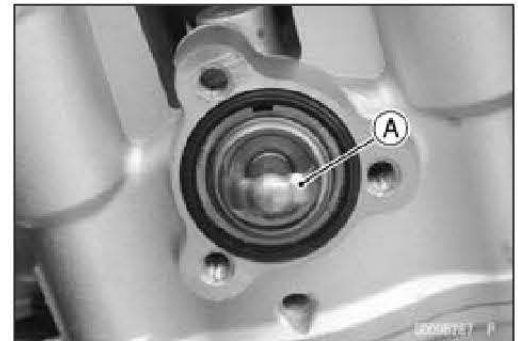
Thermostat

Thermostat Removal

- Drain the coolant (see [Coolant Change\(2-25\)](#)).
- Remove:
 - Thermostat Housing Bolts [A]
 - Thermostat Housing [B]



- Remove the thermostat [A] from the cylinder head.



Thermostat Installation

- Install the thermostat in the cylinder head so that the air bleeder hole [A] is on top.
- Apply a non-permanent locking agent to the threads of the thermostat housing bolts.
- Tighten:
 - Torque - Thermostat Housing Bolts: 12 N·m (1.2 kgf·m, 106 in·lb)**
- Fill the coolant (see [Coolant Change\(2-25\)](#)).



Thermostat Inspection

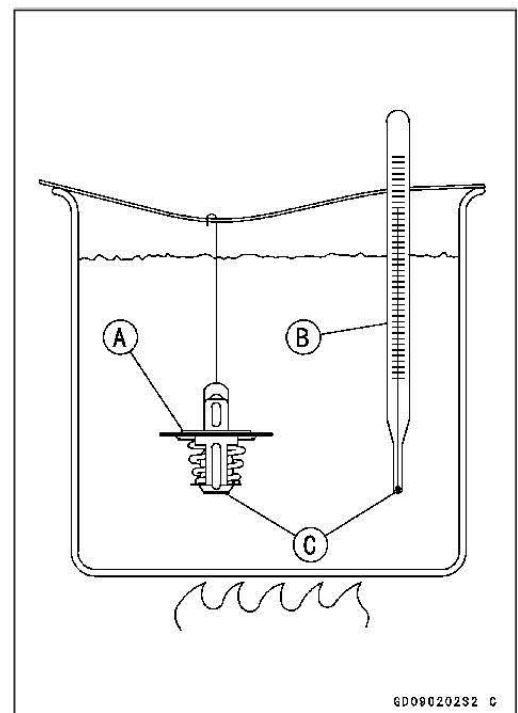
- Remove the thermostat (see [Thermostat Removal\(4-19\)](#)).
- Inspect the thermostat valve at room temperature.
- ★ If the valve is open, replace the valve with a new one.
- To check valve opening temperature, suspend the thermostat [A] and an thermometer [B] in a container of water with the heat-sensitive portions [C] in almost the same depth.

NOTE

- The thermostat must be completely submerged and must not touch the container sides or bottom.
- Gradually raise the temperature of the water while stirring the water gently for even temperature.

Thermostat Valve Opening Temperature
 69.5 °C ~ 72.5 °C (157 ~ 162°F)

- ★ If the measurement is out of the range, replace the thermostat.

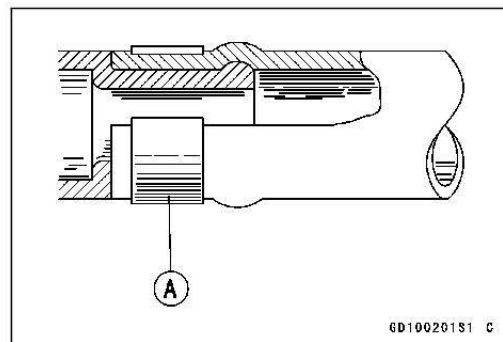


4-20 COOLING SYSTEM

Hoses

Hose Installation

- Install the hoses, being careful to follow bending direction. Avoid sharp bending, kinking, flattening or twisting.
- Run the hoses (see Cable, Wire, and Hose Routing section (17-2)).
- Install the clamp [A] as near as possible to the hose end to clear the raised rib of the fitting. This will prevent the hoses from working loose.



Hose Inspection

- Refer to the Cooling System Inspection (see Cooling System Inspection(2-25)).

Water Temperature Sensor

Water Temperature Sensor Removal

- Refer to the Water Temperature Sensor Removal ([see Water Temperature Sensor Removal\(3-55\)](#)).

Water Temperature Sensor Installation

- Refer to the Water Temperature Sensor Installation ([see Water Temperature Sensor Installation\(3-55\)](#)).

Water Temperature Sensor Inspection

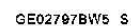
- Refer to the Water Temperature Sensor Inspection ([see Water Temperature Sensor Inspection\(16-75\)](#)).

Engine Top End

Table of Contents

Exploded View.....	5-2	Cylinder Head Installation.....	5-27
Exhaust System Identification	5-6	Cylinder Head Warp Inspection ...	5-28
Specifications	5-7	Valves	5-29
Special Tools and Sealants	5-9	Valve Clearance Inspection	5-29
Clean Air System.....	5-12	Valve Clearance Adjustment.....	5-29
Air Suction Valve Removal.....	5-12	Valve Removal	5-29
Air Suction Valve Installation.....	5-12	Valve Installation	5-29
Air Suction Valve Inspection	5-12	Valve Guide Removal	5-30
Air Switching Valve Removal	5-13	Valve Guide Installation	5-30
Air Switching Valve Installation	5-13	Valve-to-Guide Clearance	
Air Switching Valve Operation		Measurement (Wobble	
Test.....	5-13	Method).....	5-31
Air Switching Valve Unit Test	5-13	Valve Seat Inspection	5-31
Clean Air System Hose		Valve Seat Repair	5-32
Inspection.....	5-13	Cylinder, Piston.....	5-37
Cylinder Head Cover	5-14	Cylinder Removal.....	5-37
Cylinder Head Cover Removal	5-14	Cylinder Installation.....	5-37
Cylinder Head Cover Installation .	5-15	Piston Removal.....	5-38
Camshaft Chain Tensioners	5-16	Piston Installation.....	5-38
Camshaft Chain Tensioner		Cylinder Wear Inspection.....	5-39
Removal	5-16	Piston Wear Inspection	5-39
Camshaft Chain Tensioner		Piston Ring, Piston Ring Groove	
Installation.....	5-16	Wear Inspection	5-40
Camshafts, Camshaft Chain.....	5-18	Piston Ring Groove Width	
Camshaft Removal	5-18	Inspection.....	5-40
Camshaft Installation	5-19	Piston Ring Thickness Inspection	5-40
Camshaft Chain Removal.....	5-21	Piston Ring End Gap Inspection ..	5-41
Camshaft Chain Installation	5-22	Throttle Body Assy Holder.....	5-42
KACR (Kawasaki Automatic		Throttle Body Assy Holder	
Compression Release)		Removal.....	5-42
Inspection.....	5-22	Throttle Body Assy Holder	
Camshaft, Camshaft Cap Wear		Installation	5-42
Inspection.....	5-23	Muffler.....	5-43
Camshaft Runout Inspection.....	5-23	Muffler Body Removal.....	5-43
Cam Wear Inspection	5-24	Exhaust Pipe Removal.....	5-43
Cylinder Head.....	5-25	Muffler Body and Exhaust Pipe	
Cylinder Compression		Installation	5-44
Measurement	5-25	Spark Arrester Cleaning	
Cylinder Head Removal	5-26	(Equipped Models).....	5-46

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Spark Plug	13	1.3	115 in·lb	
2	Cylinder Head Cover Bolts	7.8	0.80	69 in·lb	
3	Camshaft Cap Bolts (L = 38 mm)	12	1.2	106 in·lb	S
4	Camshaft Cap Bolts (L = 46 mm)	12	1.2	106 in·lb	S
5	Cylinder Head Bolts (M10, First)	15	1.5	11	M, S
	Cylinder Head Bolts (M10, Final)	46	4.7	34	M, S
6	Cylinder Head Bolts (M6)	12	1.2	106 in·lb	S
7	Cylinder Head Jacket Plug	20	2.0	15	L
8	Cylinder Head Damper Bolt	7.8	0.80	69 in·lb	
9	Throttle Body Assy Holder Bolts	12	1.2	106 in·lb	
10	Air Suction Valve Cover Bolts	9.8	1.0	87 in·lb	L

EO: Apply engine oil.

G: Apply grease.

L: Apply a non-permanent locking agent.

LG: Apply liquid gasket.

M: Apply molybdenum disulfide grease.

MO: Apply molybdenum disulfide oil solution.

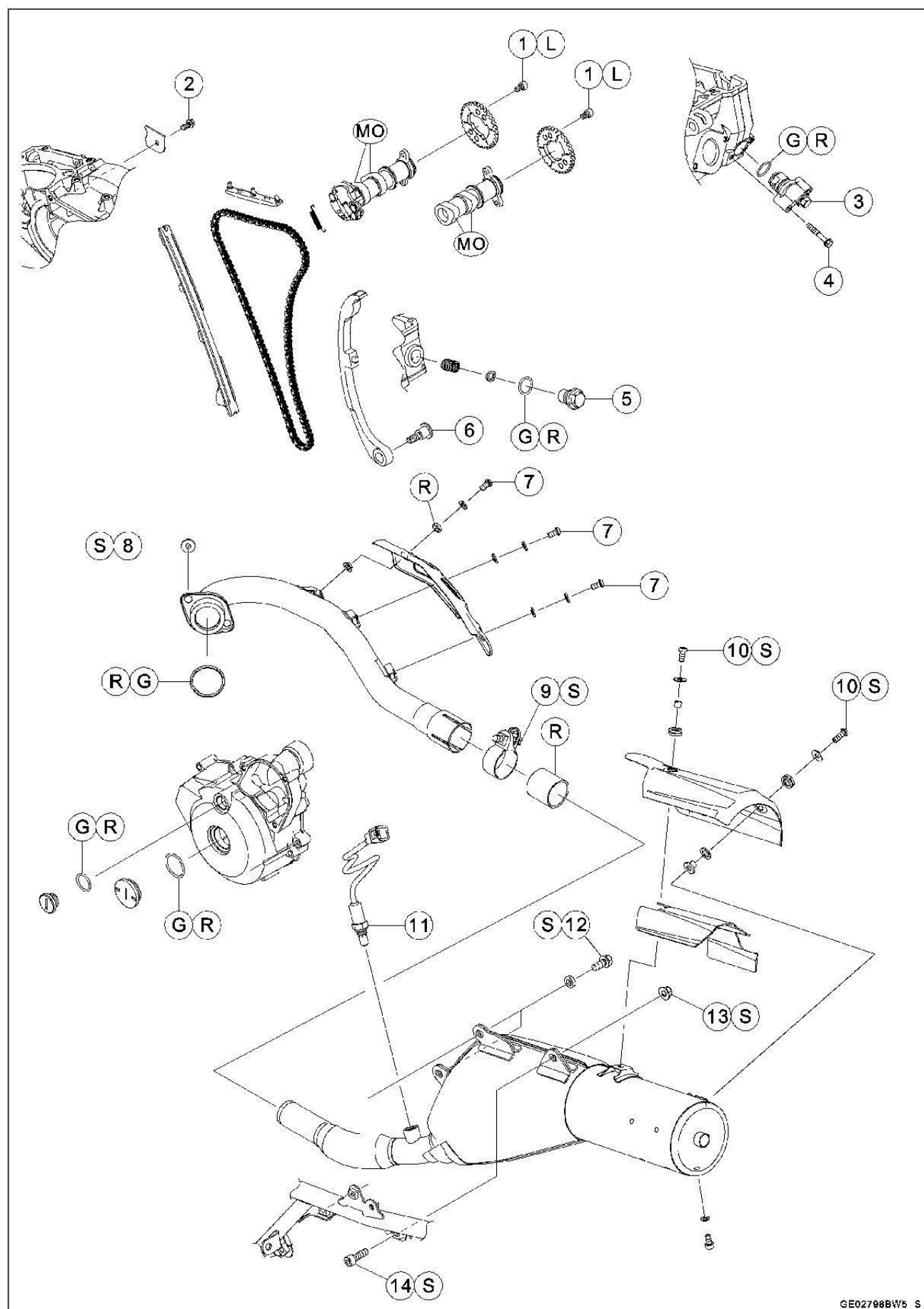
(mixture of the engine oil and molybdenum disulfide grease in a weight ratio 10:1)

R: Replacement Parts

S: Follow the specified tightening sequence.

5-4 ENGINE TOP END

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Camshaft Sprocket Bolts	9.8	1.0	87 in·lb	L
2	Camshaft Chain Guide Retaining Plate Bolt	9.8	1.0	87 in·lb	
3	Camshaft Chain Tensioner Cap Bolt	20	2.0	15	
4	Camshaft Chain Tensioner Bolts	9.8	1.0	87 in·lb	
5	Camshaft Chain Sub-tensioner Bolt	15	1.5	11	
6	Camshaft Chain Guide Bolt	25	2.5	18	
7	Exhaust Pipe Cover Bolts	9.8	1.0	87 in·lb	
8	Exhaust Pipe Holder Nuts	21	2.1	15	S
9	Muffler Body Clamp Bolt	10	1.0	89 in·lb	S
10	Muffler Cover Bolts	6.9	0.70	61 in·lb	S
11	Oxygen Sensor	25	2.5	18	
12	Muffler Body Bolts (Front/Center)	30	3.1	22	S
13	Muffler Body Nut	40	4.1	30	S
14	Muffler Body Bolt (Rear)	9.8	1.0	87 in·lb	S

G: Apply grease.

L: Apply a non-permanent locking agent.

MO: Apply molybdenum disulfide oil solution.

(mixture of the engine oil and molybdenum disulfide grease in a weight ratio 10:1)

R: Replacement Parts

S: Follow the specified tightening sequence.

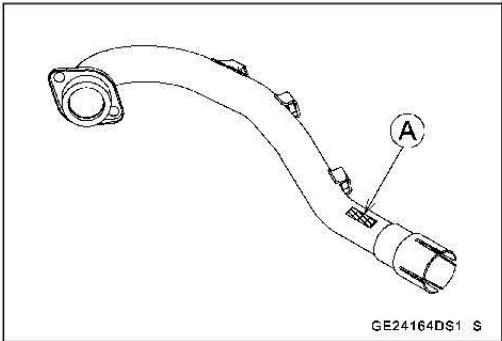
5-6 ENGINE TOP END

Exhaust System Identification

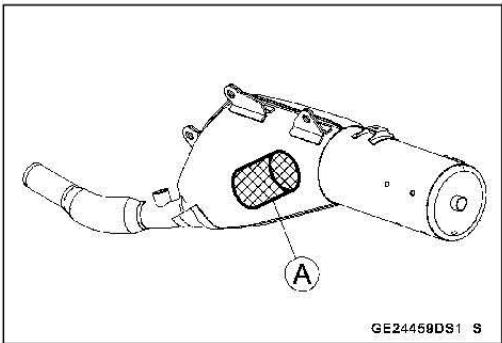
EXHAUST PIPE	MUFFLER BODY	SPECIFICATION	MODEL
Non-Catalyst P/No. 18088-1475 Mark : KHI E 064	Honeycomb Type Catalyst P/No. 18091-1196 Mark : - EPA Noise Emission Control Information	US CAL CA	KLX300DM/EM KLX300DM/EM KLX300DM/EM

GE24459D F

Exhaust Pipe Mark Position [A]



Honeycomb Type Catalyst Position [A]



Specifications

Item	Standard	Service Limit
Camshafts		
Cam Height:		
Exhaust	35.743 ~ 35.857 mm (1.4072 ~ 1.4117 in.)	35.64 mm (1.403 in.)
Intake	35.743 ~ 35.857 mm (1.4072 ~ 1.4117 in.)	35.64 mm (1.403 in.)
Camshaft Journal/Cap Clearance	0.020 ~ 0.062 mm (0.0008 ~ 0.0024 in.)	0.15 mm (0.0059 in.)
Camshaft Journal Diameter	22.959 ~ 22.980 mm (0.90390 ~ 0.90472 in.)	22.93 mm (0.9028 in.)
Camshaft Bearing Inside Diameter	23.000 ~ 23.021 mm (0.90551 ~ 0.90634 in.)	23.08 mm (0.9087 in.)
Camshaft Runout	TIR 0.02 mm (0.0008 in.) or less	TIR 0.1 mm (0.004 in.)
KACR Operating Engine Speed	505 ±55 r/min (rpm)	— — —
Cylinder Head		
Cylinder Compression	(Usable Range) 1 113 ~ 1 688 kPa (11.35 ~ 17.22 kgf/cm ² , 161.4 ~ 244.8 psi) @960 r/min (rpm)	— — —
Cylinder Head Warp	— — —	0.05 mm (0.002 in.)
Valves		
Valve Clearance:		
Exhaust	0.15 ~ 0.24 mm (0.0059 ~ 0.0094 in.)	— — —
Intake	0.10 ~ 0.19 mm (0.0039 ~ 0.0075 in.)	— — —
Valve Head Thickness:		
Exhaust	0.8 mm (0.031 in.)	0.7 mm (0.03 in.)
Intake	0.5 mm (0.020 in.)	0.3 mm (0.01 in.)
Valve Stem Bend	TIR 0.01 mm (0.0004 in.) or less	TIR 0.05 mm (0.002 in.)
Valve Stem Diameter:		
Exhaust	4.455 ~ 4.470 mm (0.1754 ~ 0.1760 in.)	4.44 mm (0.175 in.)
Intake	4.475 ~ 4.490 mm (0.1762 ~ 0.1768 in.)	4.46 mm (0.176 in.)
Valve Guide Inside Diameter:		
Exhaust	4.500 ~ 4.512 mm (0.1772 ~ 0.1776 in.)	4.58 mm (0.180 in.)
Intake	4.500 ~ 4.512 mm (0.1772 ~ 0.1776 in.)	4.58 mm (0.180 in.)
Valve/Valve Guide Clearance (Wobble Method):		
Exhaust	0.08 ~ 0.15 mm (0.0031 ~ 0.0059 in.)	0.33 mm (0.013 in.)
Intake	0.03 ~ 0.10 mm (0.0012 ~ 0.0039 in.)	0.28 mm (0.011 in.)
Valve Seat Cutting Angle	32°, 45°, 60°	— — —
Valve Seating Surface:		
Outside Diameter:		
Exhaust	24.4 ~ 24.6 mm (0.96 ~ 0.97 in.)	— — —
Intake	28.4 ~ 28.6 mm (1.12 ~ 1.13 in.)	— — —
Width:		
Exhaust	0.5 ~ 1.0 mm (0.020 ~ 0.039 in.)	— — —
Intake	0.5 ~ 1.0 mm (0.020 ~ 0.039 in.)	— — —

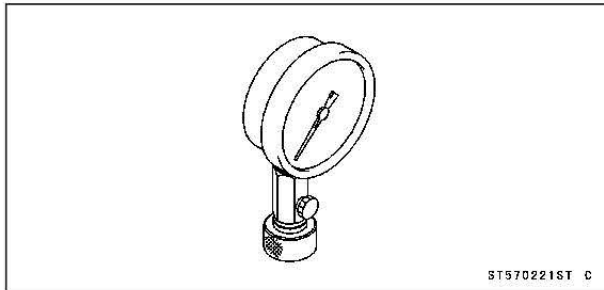
5-8 ENGINE TOP END

Specifications

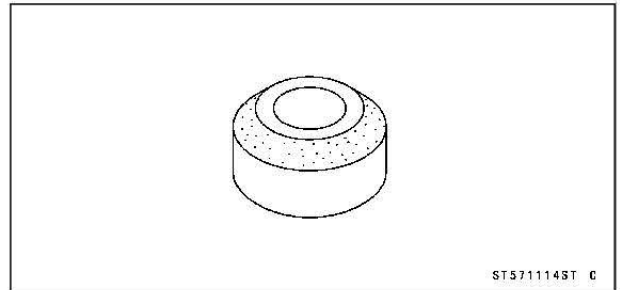
Item	Standard	Service Limit
Valve Spring Free Length:		
Exhaust	39.7 mm (1.56 in.)	39.3 mm (1.55 in.)
Intake	39.7 mm (1.56 in.)	39.3 mm (1.55 in.)
Cylinder, Piston		
Cylinder Inside Diameter	78.000 ~ 78.012 mm (3.0709 ~ 3.0713 in.)	78.06 mm (3.073 in.)
Piston Diameter	77.950 ~ 77.965 mm (3.0689 ~ 3.0695 in.)	77.80 mm (3.063 in.)
Piston/Cylinder Clearance	0.035 ~ 0.062 mm (0.0014 ~ 0.0024 in.)	— — —
Piston Ring/Groove Clearance:		
Top	0.030 ~ 0.070 mm (0.00118 ~ 0.00276 in.)	0.17 mm (0.0067 in.)
Second	0.030 ~ 0.070 mm (0.00118 ~ 0.00276 in.)	0.17 mm (0.0067 in.)
Piston Ring Groove Width:		
Top	1.02 ~ 1.04 mm (0.0402 ~ 0.0409 in.)	1.12 mm (0.0441 in.)
Second	1.02 ~ 1.04 mm (0.0402 ~ 0.0409 in.)	1.12 mm (0.0441 in.)
Piston Ring Thickness:		
Top	0.97 ~ 0.99 mm (0.038 ~ 0.039 in.)	0.90 mm (0.035 in.)
Second	0.97 ~ 0.99 mm (0.038 ~ 0.039 in.)	0.90 mm (0.035 in.)
Piston Ring End Gap:		
Top	0.20 ~ 0.35 mm (0.0079 ~ 0.0138 in.)	0.7 mm (0.03 in.)
Second	0.20 ~ 0.40 mm (0.0079 ~ 0.0157 in.)	0.7 mm (0.03 in.)

Special Tools and Sealants

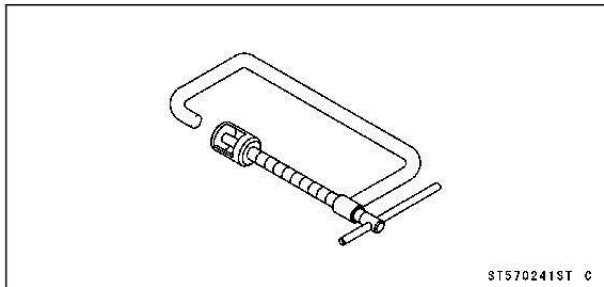
**Compression Gauge, 20 kgf/cm²:
57001-221**



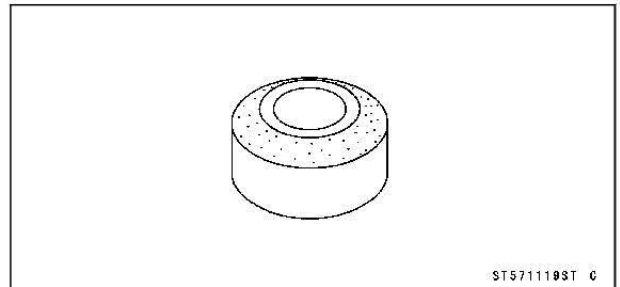
**Valve Seat Cutter, 45° - ϕ 27.5:
57001-1114**



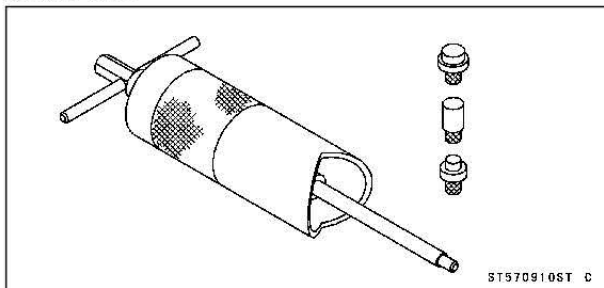
**Valve Spring Compressor Assembly:
57001-241**



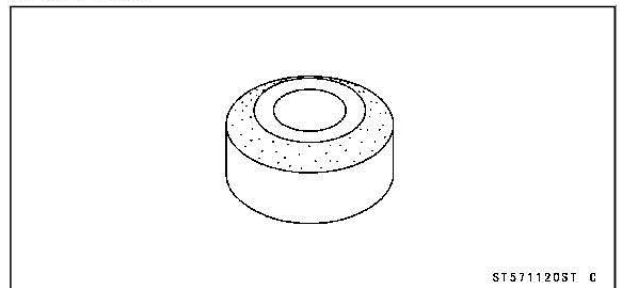
**Valve Seat Cutter, 32° - ϕ 28:
57001-1119**



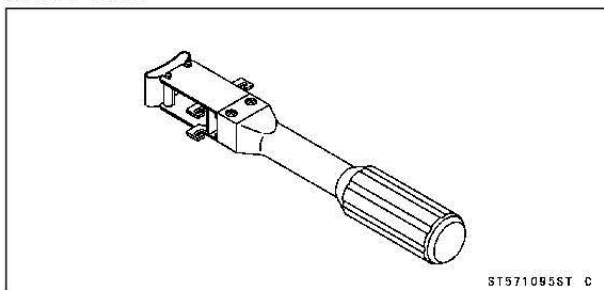
**Piston Pin Puller Assembly:
57001-910**



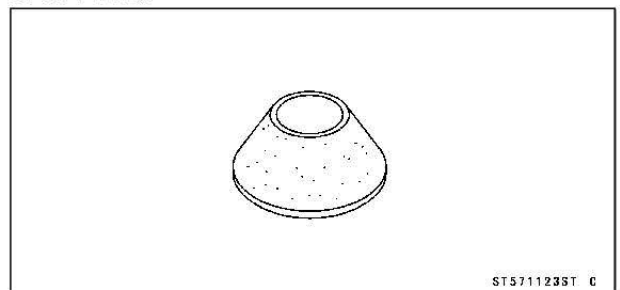
**Valve Seat Cutter, 32° - ϕ 30:
57001-1120**



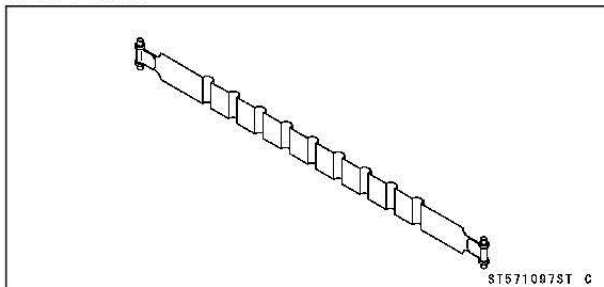
**Piston Ring Compressor Grip:
57001-1095**



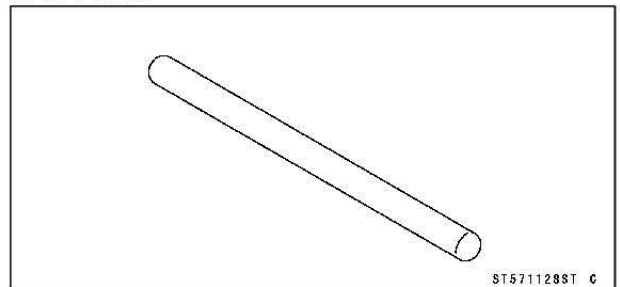
**Valve Seat Cutter, 60° - ϕ 30:
57001-1123**



**Piston Ring Compressor Belt, ϕ 67 ~ ϕ 79:
57001-1097**



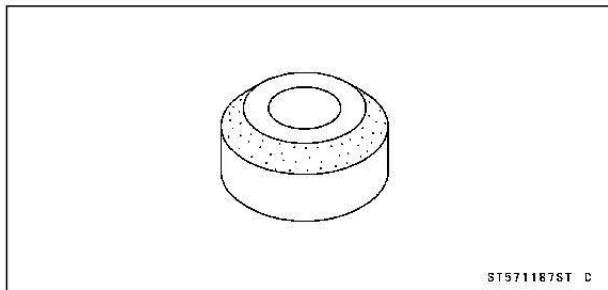
**Valve Seat Cutter Holder Bar:
57001-1128**



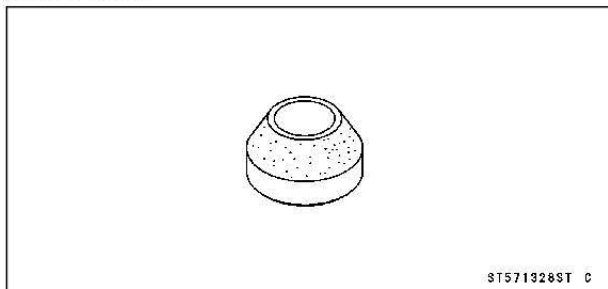
5-10 ENGINE TOP END

Special Tools and Sealants

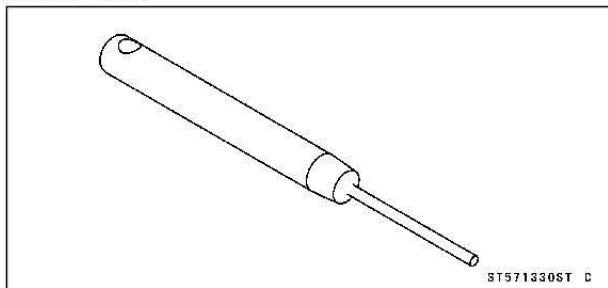
Valve Seat Cutter, 45° - ϕ 30:
57001-1187



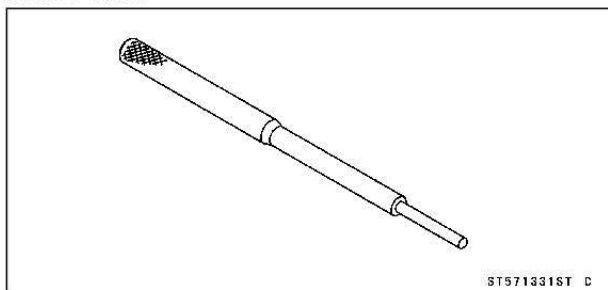
Valve Seat Cutter, 60° - ϕ 25:
57001-1328



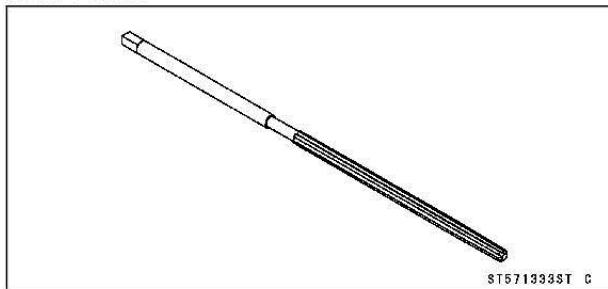
Valve Seat Cutter Holder, ϕ 4.5:
57001-1330



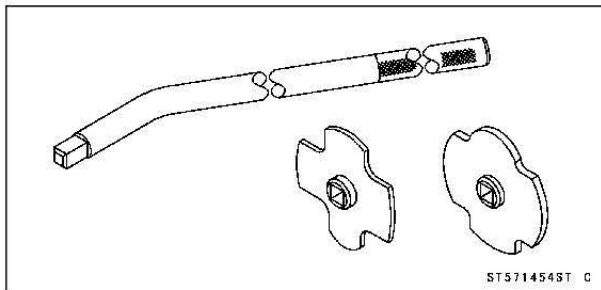
Valve Guide Arbor, ϕ 4.5:
57001-1331



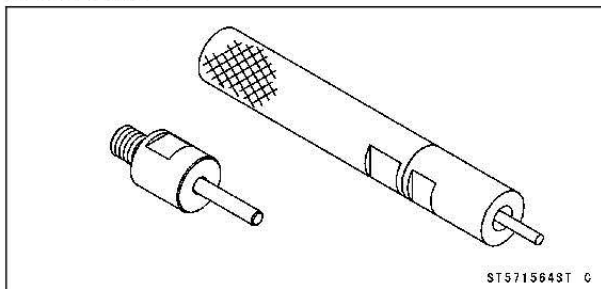
Valve Guide Reamer, ϕ 4.5:
57001-1333



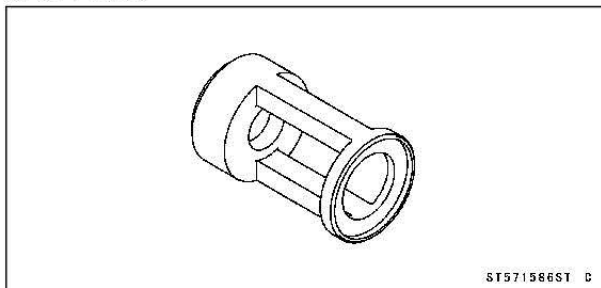
Filler Cap Driver:
57001-1454



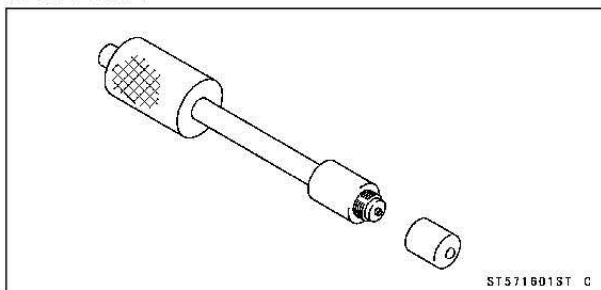
Valve Guide Driver:
57001-1564



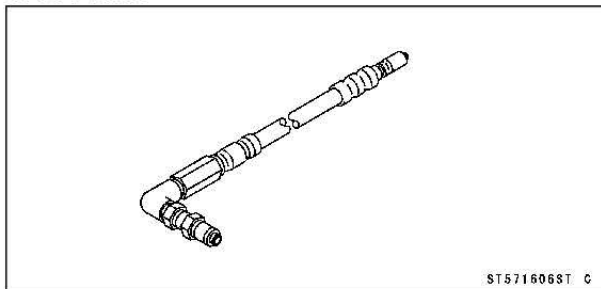
Valve Spring Compressor Adapter, ϕ 24:
57001-1586



Compression Gauge Adapter, M10 $\times$ 1.0:
57001-1601

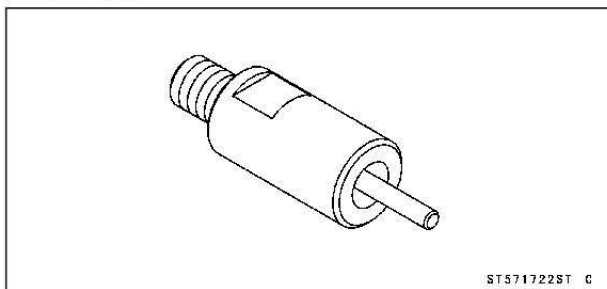


L-Shape Hose:
57001-1606

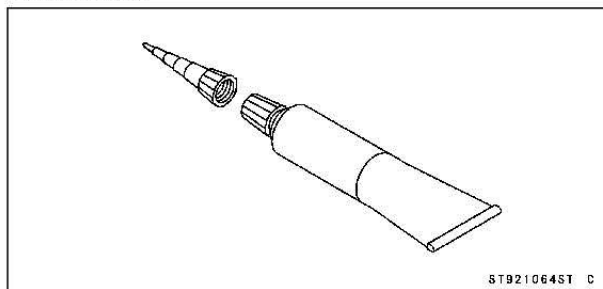


Special Tools and Sealants

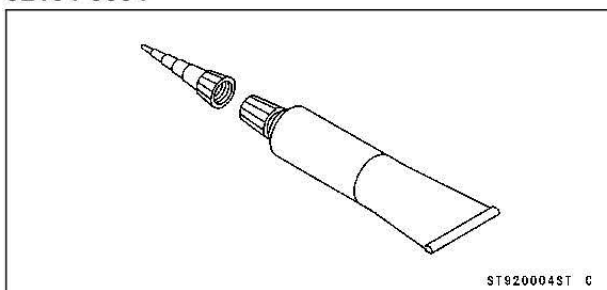
Valve Guide Driver Attachment, F:
57001-1722



Liquid Gasket, TB1216B:
92104-1064



Liquid Gasket, TB1211F:
92104-0004

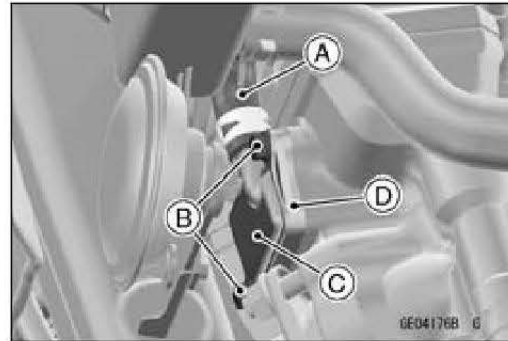


5-12 ENGINE TOP END

Clean Air System

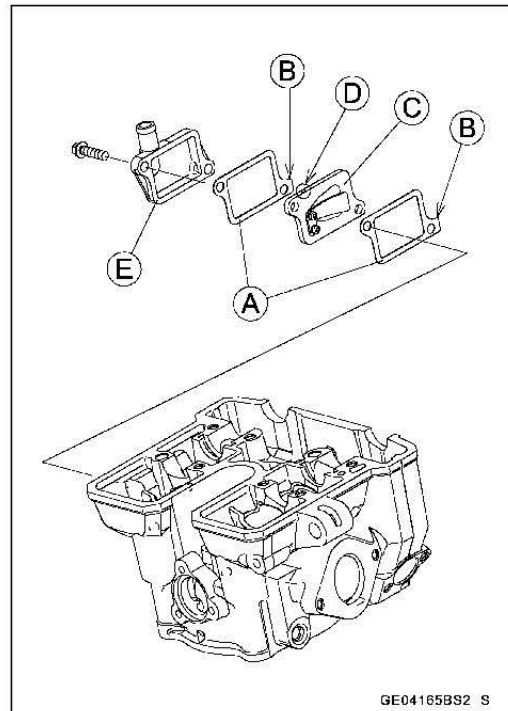
Air Suction Valve Removal

- Remove:
 - Canister (see Evaporative Emission Control System Inspection (CAL Model)(2-24))
- Slide the clamp and disconnect the air suction valve hose [A].
- Remove:
 - Air Suction Valve Cover Bolts [B]
 - Air Suction Valve Cover [C]
 - Air Suction Valve [D]
 - Gaskets



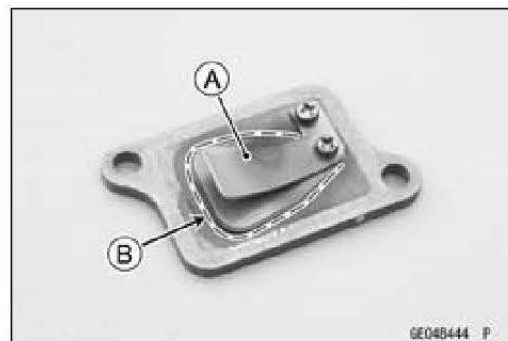
Air Suction Valve Installation

- Replace the gaskets [A] with new ones.
 - Angular End [B]
- Install the air suction valve [C] so that the paint mark [D] side faces upward.
- Install:
 - Air Suction Valve Cover [E]
- Apply a non-permanent locking agent to the air suction valve cover bolts.
- Tighten:
 - Torque - Air Suction Valve Cover Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)**
- Install the removed parts.



Air Suction Valve Inspection

- Remove the air suction valve (see Air Suction Valve Removal(5-12)).
- Visually inspect the reed [A] for cracks, folds, warps, heat damage or other damage.
- ★ If there is any doubt as to the condition of the reed, replace the air suction valve as an assembly.
- Check the reed contact area [B] of the valve holder for grooves, scratches, any signs of separation from the holder or heat damage.
- ★ If there is any doubt as to the condition of the reed contact area, replace the air suction valve as an assembly.
- ★ If any carbon or other foreign particles have accumulated between the reed and the reed contact area, wash the valve assembly clean with a high flash-point solvent.



NOTICE

Do not scrape off the deposits with a scraper as this could damage the rubber, requiring replacement of the suction valve assembly.

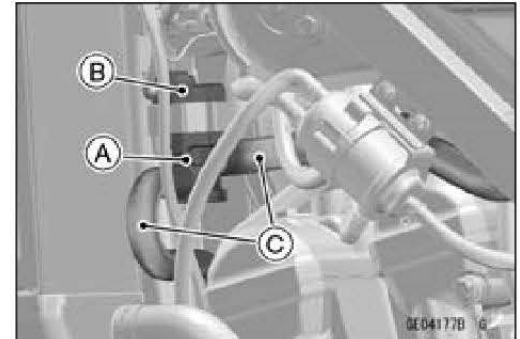
Clean Air System

Air Switching Valve Removal

NOTICE

Never drop the air switching valve especially on a hard surface. Such a shock to the air switching valve can damaged it.

- Remove:
 - Left Shroud (see Shroud Removal(15-10))
 - Spark Plug Cap (see Spark Plug Replacement(2-58))
- Remove the air switching valve [A] from the bracket of the frame.
- Disconnect:
 - Air Switching Valve Connector [B]
 - Air Switching Valve Hoses [C]



Air Switching Valve Installation

- Installation is the reverse of removal.
- Run the air switching valve hoses correctly (see Cable, Wire, and Hose Routing section (17-2)).

Air Switching Valve Operation Test

- Refer to the Air Suction System Damage Inspection (see Air Suction System Damage Inspection(2-32)).

Air Switching Valve Unit Test

- Refer to the Air Switching Valve Unit Test (see Air Switching Valve Unit Test(16-61)).

Clean Air System Hose Inspection

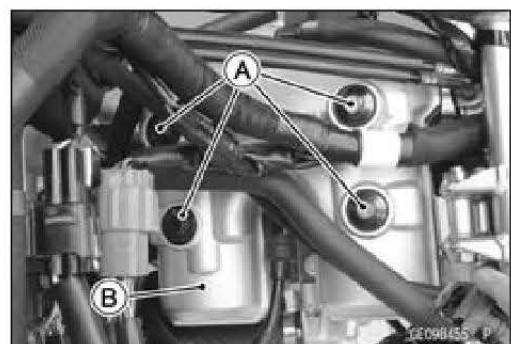
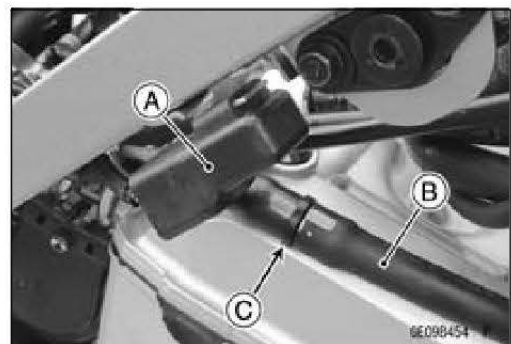
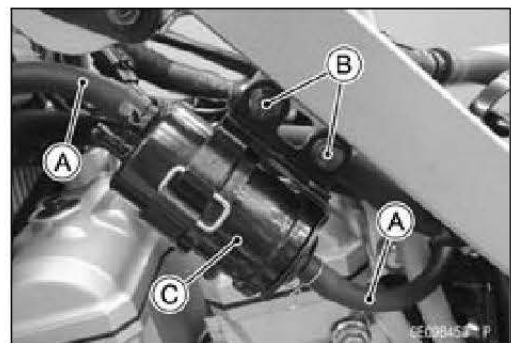
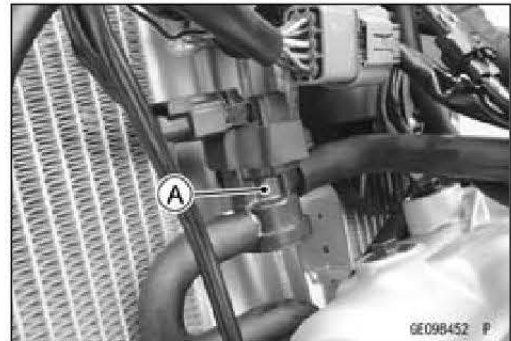
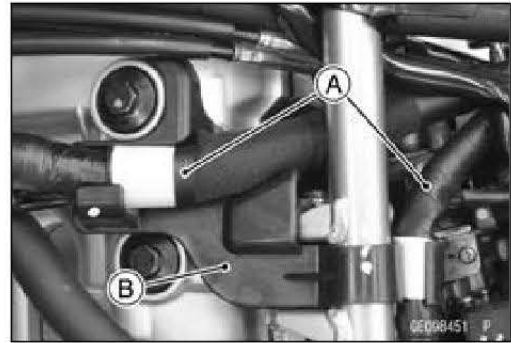
- Be certain that all the hoses are routed without being flattened or kinked, and are connected correctly to the air cleaner housing, air switching valve and air suction valve cover.
- ★ If they are not, correct them. Replace them if they are damaged.

5-14 ENGINE TOP END

Cylinder Head Cover

Cylinder Head Cover Removal

- Remove:
 - Fuel Tank (see Fuel Tank Removal(3-113))
 - Remove the main harness [A] from the holder [B].
 - Remove the holder.
-
- Remove the air switching valve [A] from the frame with the hoses and connector installed.
-
- For evaporative emission control system equipped model, remove the following parts.
 - Hoses [A]
 - Bolts [B]
 - Separator [C] with Bracket
-
- Remove the fuel pump relay [A] from the frame with the connector installed.
 - For evaporative emission control system equipped model, disconnect the canister hose [B] from the fitting [C].
-
- Remove:
 - Cylinder Head Cover Bolts [A]
 - Washers
 - Cylinder Head Cover [B]



Cylinder Head Cover

Cylinder Head Cover Installation

- Replace the cylinder head cover gasket with a new one.
- Using a high flash-point solvent, clean off any oil or dirt that may be on the liquid gasket coating area. Dry them with a clean cloth.
- Apply liquid gasket [A] to the cylinder head as shown.

Sealant - Liquid Gasket, TB1216B: 92104-1064

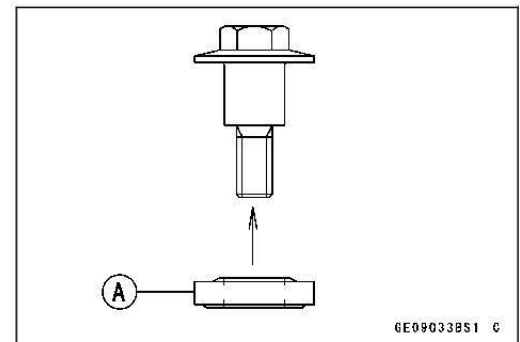
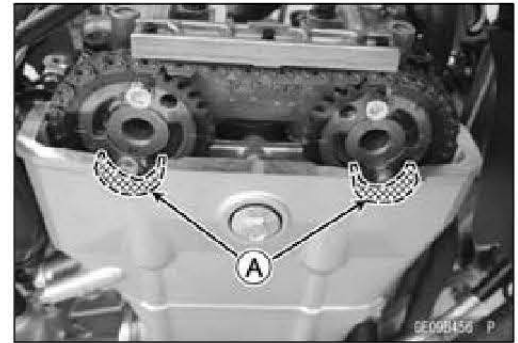
NOTE

○ *Make the tightening the cylinder head cover bolts finish within 20 minutes when the liquid gasket is applied.*

- Install the cylinder head cover gasket to the cylinder head cover.
- Replace the washers [A] with new ones.
- Install the washers with metal side faces upward.
- Tighten:

Torque - Cylinder Head Cover Bolts: 7.8 N·m (0.80 kgf·m, 69 in·lb)

- Install the removed parts.



5-16 ENGINE TOP END

Camshaft Chain Tensioners

Camshaft Chain Tensioner Removal

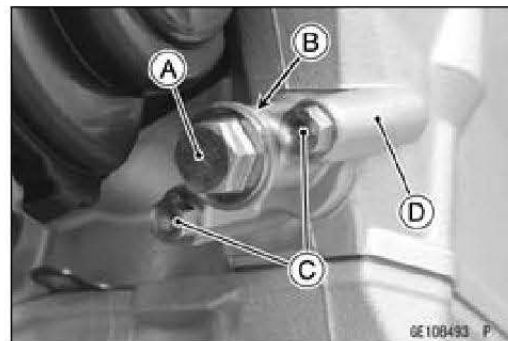
NOTICE

This is a non-return type camshaft chain tensioner. The push rod does not return to its original position once it moves out to take up camshaft chain slack. Observe all the rules listed below.

When removing the tensioner, do not take out the mounting bolts only halfway. Retightening the mounting bolts from this position could damage the tensioner and the camshaft chain. Once the bolts are loosened, the tensioner must be removed and reset as described in "Camshaft Chain Tensioner Installation."

Do not turn over the crankshaft while the tensioner is removed. This could upset the camshaft chain timing, and damage the valves.

- Remove:
 - Exhaust Pipe (see Exhaust Pipe Removal(5-43))
 - Camshaft Chain Tensioner Cap Bolt [A]
 - Washer [B]
 - Spring
 - Camshaft Chain Tensioner Bolts [C]
 - Camshaft Chain Tensioner Body [D]
 - O-ring



- Remove:
 - Camshaft Chain Sub-tensioner Bolt [A]
 - O-ring
 - Washer
 - Spring

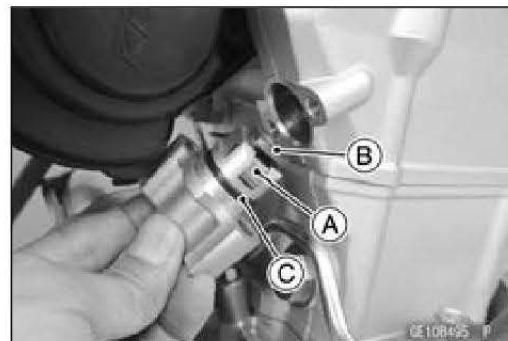


Camshaft Chain Tensioner Installation

NOTICE

Always install the camshaft chain tensioner after timing the cam shaft chain.

- Release the stopper [A] and insert the push rod [B] as far as it will go.
- Replace the O-ring [C] with a new one.
- Apply grease to the O-ring.
- Install the tensioner body so that the stopper faces downward.



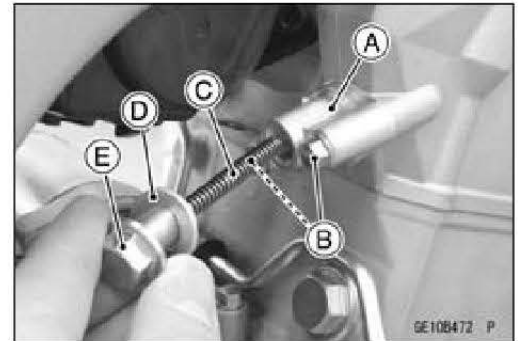
Camshaft Chain Tensioners

- Install the camshaft chain tensioner body [A] to the cylinder head fully.
- Tighten:

Torque - Camshaft Chain Tensioner Bolts [B]: 9.8 N·m (1.0 kgf·m, 87 in·lb)

- Install:
 - Spring [C]
 - Washer [D]
- Tighten:

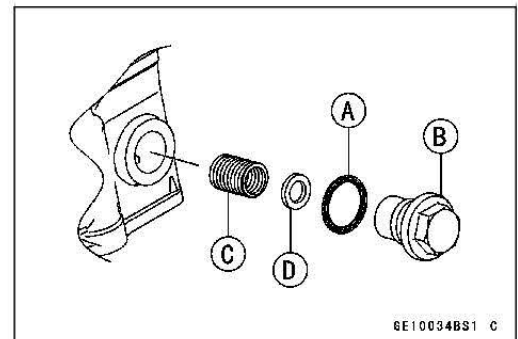
Torque - Camshaft Chain Tensioner Cap Bolt [E]: 20 N·m (2.0 kgf·m, 15 ft·lb)



- Replace the O-ring [A] with a new one.
- Apply grease to the O-ring.
- Install the O-ring to the camshaft chain sub-tensioner bolt [B].
- Install:
 - Spring [C]
 - Washer [D]
- Tighten:

Torque - Camshaft Chain Sub-tensioner Bolt: 15 N·m (1.5 kgf·m, 11 ft·lb)

- Install the removed parts.



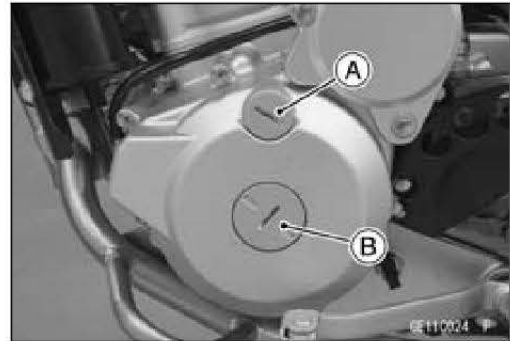
5-18 ENGINE TOP END

Camshafts, Camshaft Chain

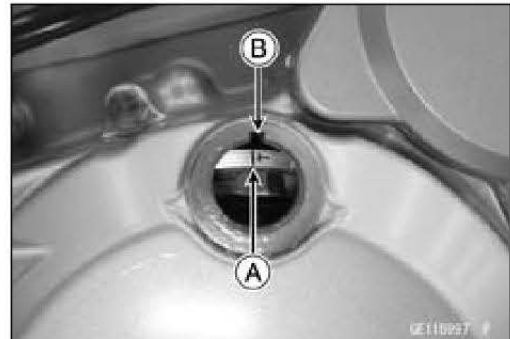
Camshaft Removal

- Remove:
 - Cylinder Head Cover (see [Cylinder Head Cover Removal\(5-14\)](#))
 - Timing Inspection Cap [A]
 - Alternator Rotor Bolt Cap [B]

Special Tool - Filler Cap Driver: 57001-1454



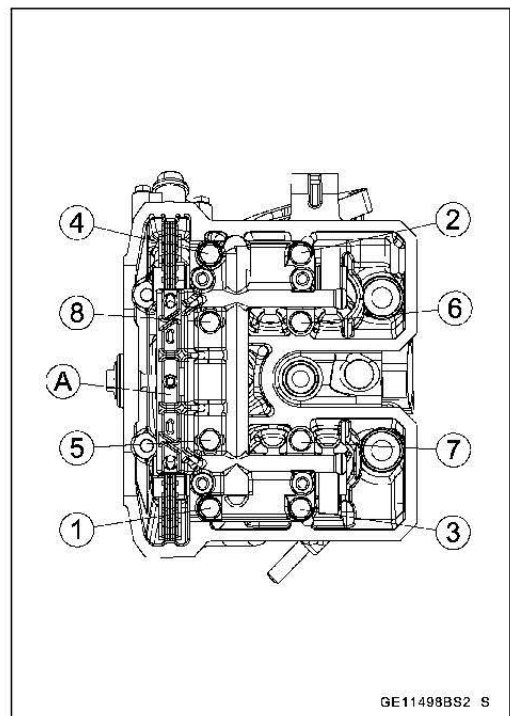
- Turn the crankshaft counterclockwise and align the "T" line [A] of the alternator rotor with the notch [B] of the alternator cover.



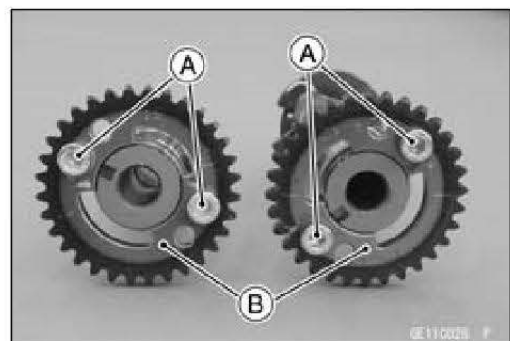
- Remove:
 - Camshaft Chain Tensioners (see [Camshaft Chain Tensioner Removal\(5-16\)](#))
- Loosen the camshaft cap bolts gradually and evenly as shown sequence [1 ~ 8], and remove them.
- Remove:
 - Camshaft Cap [A]
 - Camshafts
- Stuff a clean cloth into the chain tunnel to keep any parts from dropping into the crankcase.

NOTICE

The crankshaft may be turned while the camshafts are removed. Always pull the chain taut while turning the crankshaft. This avoids kinking the chain on the lower (crankshaft) sprocket. A kinked chain could damage the crankcase.



- Remove:
 - Camshaft Chain Sprocket Bolts [A]
 - Camshaft Chain Sprockets [B]



Camshafts, Camshaft Chain

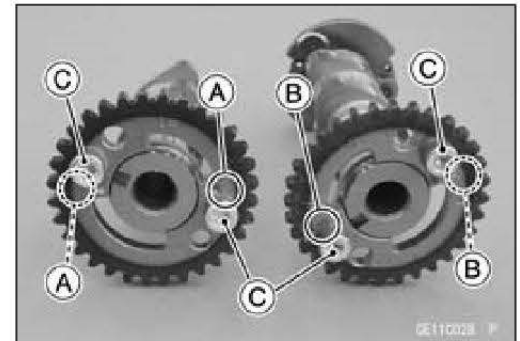
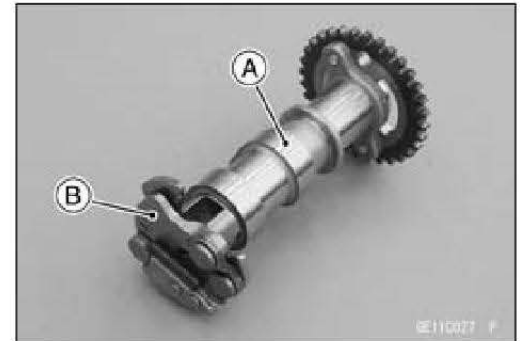
Camshaft Installation

NOTE

- The exhaust camshaft [A] has compression release mechanism [B].
- The intake camshaft sprocket and exhaust camshaft sprocket are identical.

- Install the camshaft sprocket to the camshaft.
- Face the "IN" and "EX" marks to outside.
- For intake camshaft, install the camshaft sprocket bolts to the holes that are marked "IN" [A].
- For exhaust camshaft, install the camshaft sprocket bolts to the holes that are marked "EX" [B].
- Apply a non-permanent locking agent to the camshaft sprocket bolts [C] and tighten them.

Torque - Camshaft Sprocket Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)



5-20 ENGINE TOP END

Camshafts, Camshaft Chain

- Check that the “T” line of the alternator rotor aligns with the notch of the alternator cover.

NOTICE

The crankshaft may be turned while the camshafts are removed. Always pull the chain taut while turning the crankshaft. This avoids kinking the chain on the lower (crankshaft) sprocket. A kinked chain could damage the crankcase.

- Apply molybdenum disulfide oil solution to all cam parts and journals.
- Engage the camshaft chain [A] with the camshaft sprockets.
- Pull the tension side (exhaust side) of the camshaft chain taut to install the chain on the sprocket.
- The timing marks must be aligned with the cylinder head upper surface [B].

“EX” Mark [C]

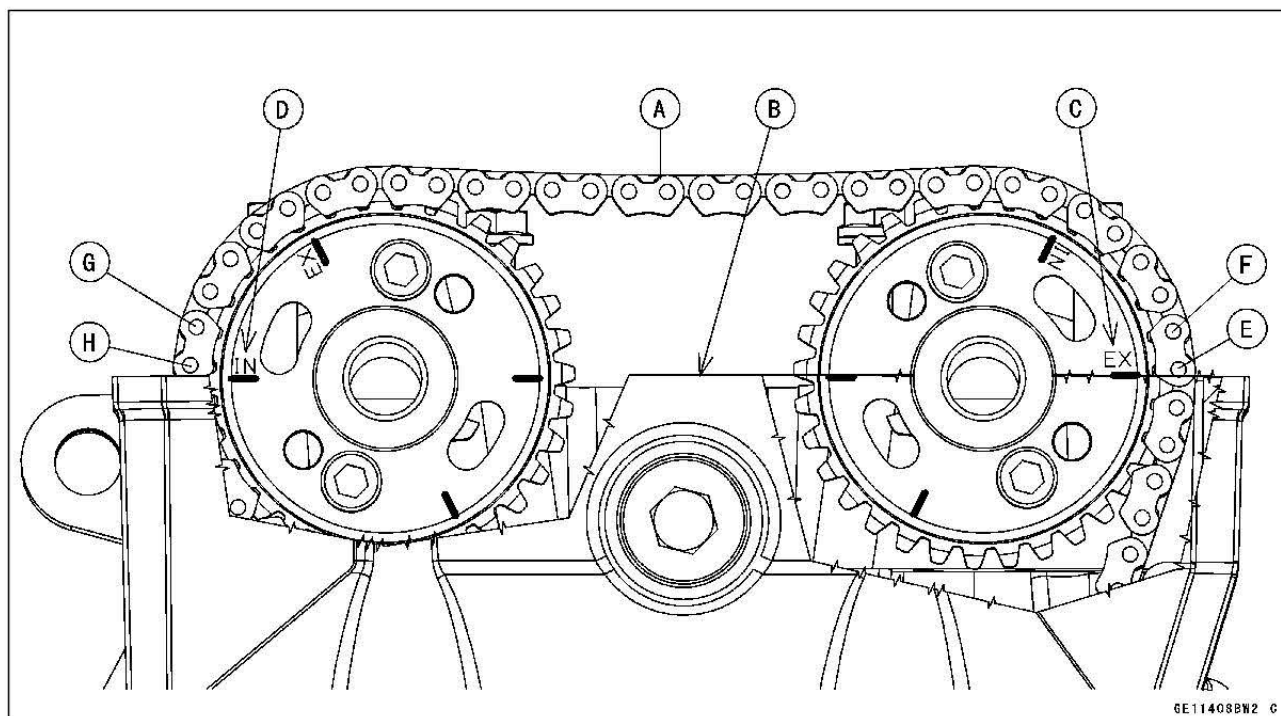
#2 Pin [F]

“IN” Mark [D]

#31 Pin [G]

#1 Pin [E]

#32 Pin [H]

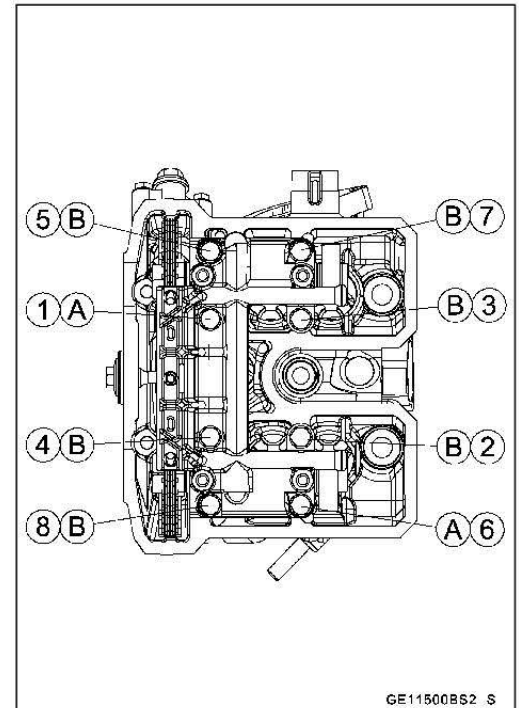
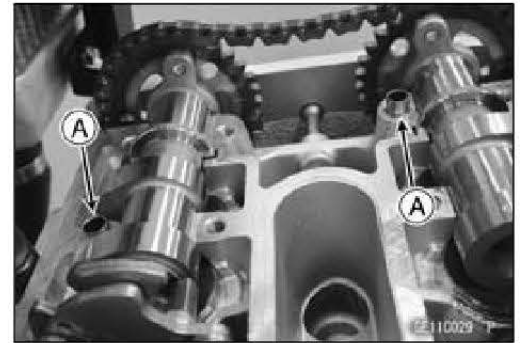


- Check that the upper camshaft chain guide [A] is not damaged.
- ★ If the upper camshaft chain guide is damaged, replace it with a new one.



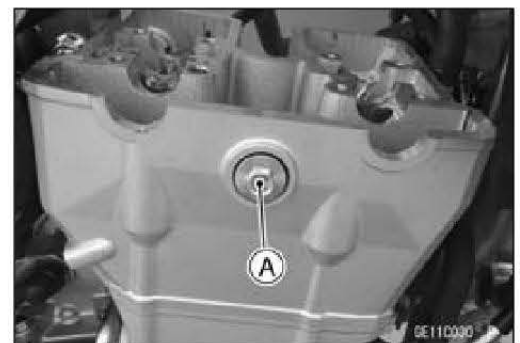
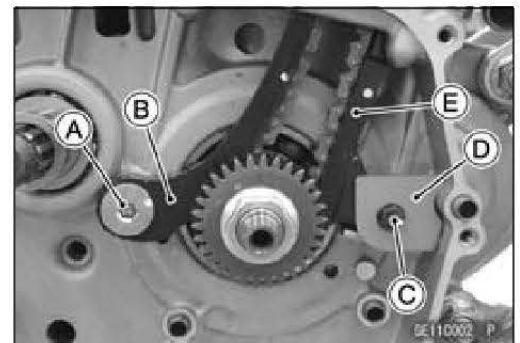
Camshafts, Camshaft Chain

- Install:
 - Dowel Pins [A]
 - Camshaft Cap
 - Install the camshaft cap bolts as shown.
 - L = 46 mm (1.8 in.) [A]
 - L = 38 mm (1.5 in.) [B]
 - Tighten the all camshaft cap bolts gradually and evenly to seat the camshaft in place.
 - Tighten all bolts following the specified tightening sequence [1 ~ 8].
- Torque - Camshaft Cap Bolts: 12 N·m (1.2 kgf·m, 106 in·lb)**
- Install the camshaft chain tensioners (see [Camshaft Chain Tensioner Installation\(5-16\)](#)).
 - Turn the crankshaft 2 turns counterclockwise to allow the tensioner to expand and recheck the camshaft chain timing.
 - Install the removed parts.



Camshaft Chain Removal

- Remove:
 - Clutch (see [Clutch Removal\(6-14\)](#))
 - Oil Pump (see [Oil Pump Removal\(7-11\)](#))
 - Camshafts (see [Camshaft Removal\(5-18\)](#))
 - Camshaft Chain Guide Bolt [A]
 - Rear Camshaft Chain Guide [B]
 - Camshaft Chain Guide Retaining Plate Bolt [C]
 - Camshaft Chain Guide Retaining Plate [D]
 - Front Camshaft Chain Guide [E]
- Remove:
 - Cylinder Head Damper Bolt [A]
 - Washer
 - Camshaft Chain



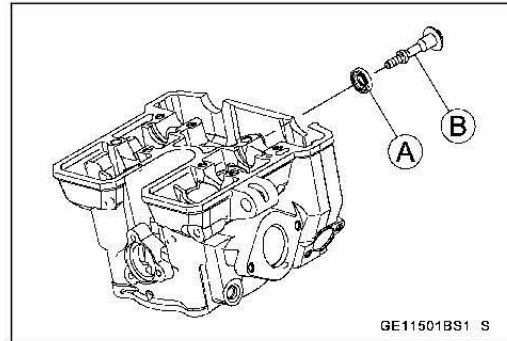
5-22 ENGINE TOP END

Camshafts, Camshaft Chain

Camshaft Chain Installation

- Replace the washer [A] with a new one.
- Install the washer with the metal side faces outward.
- Put the camshaft chain in the cylinder head and tighten the cylinder head damper bolt [B].

Torque - Cylinder Head Damper Bolt: 7.8 N·m (0.80 kgf·m, 69 in·lb)

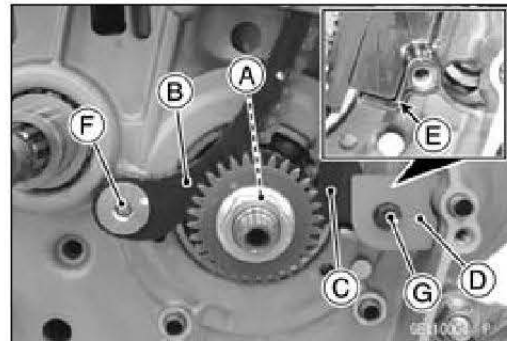


- Engage the camshaft chain with the crankshaft sprocket [A].
- Install:
 - Rear Camshaft Chain Guide [B]
 - Front Camshaft Chain Guide [C]
 - Camshaft Chain Guide Retaining Plate [D]
- Place the boss of the front camshaft chain guide on the stopper [E].
- Tighten:

Torque - Camshaft Chain Guide Bolt [F]: 25 N·m (2.5 kgf·m, 18 ft·lb)

Camshaft Chain Guide Retaining Plate Bolt [G]: 9.8 N·m (1.0 kgf·m, 87 in·lb)

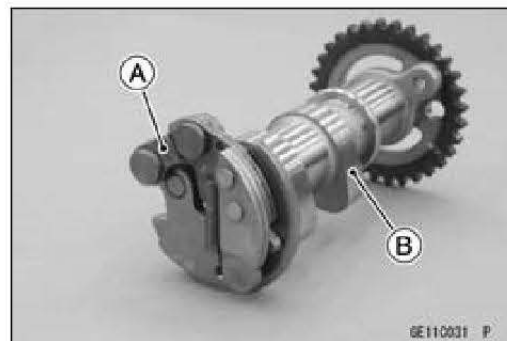
- Install the removed parts.



KACR (Kawasaki Automatic Compression Release) Inspection

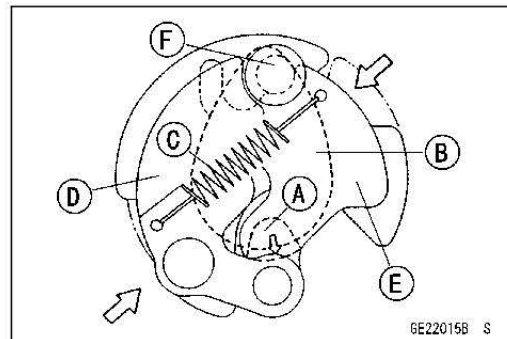
KACR [A] is installed on the left end of the exhaust camshaft [B]. Do not remove or disassemble KACR alone.

- Since KACR is the simple construction, it does not require periodic maintenance. The KACR mechanism may develop two types of failures. They are failing to release compression pressure in starting the engine and releasing compression pressure while the engine is running.



- When compression pressure in the cylinder is not released in starting the engine (an error event), the pin [A] remains in the cam [B], so that the exhaust valve is not pushed down, which results in hard starting due to difficulty to increase the crank shaft rotation speed.

- Visually inspect the spring [C].
 - ★ If the spring is damaged, deformed or lost, replace it.
 - Remove the spring, and move the weights [D] and [E] back and forth.
 - ★ If the weights do not move freely, replace the exhaust camshaft and KACR as a set.
- Stopper [F]



Camshafts, Camshaft Chain

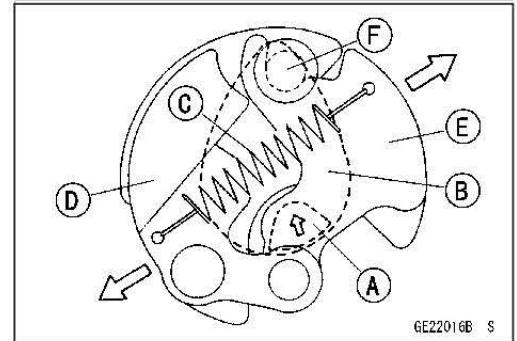
○When compression pressure in the cylinder is released while the engine is rotating (an error event), the pin [A] remains in the cam [B], so that the exhaust valve is pushed down, which results in engine stalling due to poor ignition, because a fuel-air mixture is not properly compressed.

● Move the weights [D] and [E] back and forth.

★ If you cannot move the weights from their retracted positions, replace the exhaust camshaft and KACR as a set.

Spring [C]

Stopper [F]



Camshaft, Camshaft Cap Wear Inspection

● Remove:

Camshaft Cap (see [Camshaft Removal\(5-18\)](#))

● Cut the strips of plastigage (press gauge) to journal width. Place a strip on each journal parallel to the camshaft installed in the correct position.

● Tighten the camshaft cap bolts to the specified torque (see [Camshaft Installation\(5-19\)](#)).

NOTE

○Do not turn the camshaft when the plastigage is between the journal and camshaft cap.

● Remove the camshaft cap again, measure each clearance between the camshaft journal and the camshaft cap using the plastigage [A].

Camshaft Journal/Cap Clearance

Standard: 0.020 ~ 0.062 mm (0.0008 ~ 0.0024 in.)

Service Limit: 0.15 mm (0.0059 in.)

★ If any clearance exceeds the service limit, measure the diameter of each camshaft journal with a micrometer.

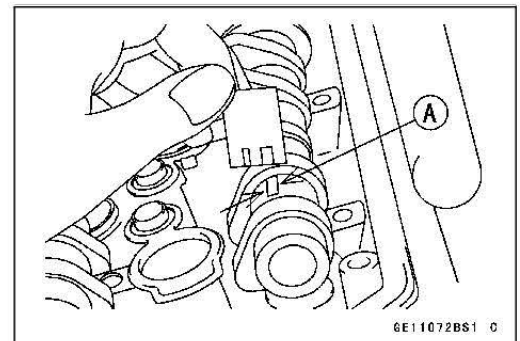
Camshaft Journal Diameter

Standard: 22.959 ~ 22.980 mm (0.90390 ~ 0.90472 in.)

Service Limit: 22.93 mm (0.9028 in.)

★ If the camshaft journal diameter is less than the service limit, replace the camshaft with a new one and measure the clearance again.

★ If the clearance still remains out of the service limit, replace the cylinder head unit.



Camshaft Runout Inspection

● Remove the camshafts (see [Camshaft Removal\(5-18\)](#)).

● Set the camshaft in a camshaft alignment jig or on V blocks.

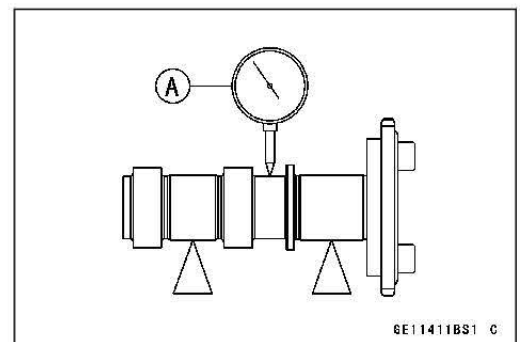
● Measure the runout with a dial gauge [A] at the specified place as shown.

Camshaft Runout

Standard: TIR 0.02 mm (0.0008 in.) or less

Service Limit: TIR 0.1 mm (0.004 in.)

★ If the runout exceeds the service limit, replace the camshaft.



5-24 ENGINE TOP END

Camshafts, Camshaft Chain

Cam Wear Inspection

- Remove the camshafts (see [Camshaft Removal\(5-18\)](#)).
- Measure the height [A] of each cam with a micrometer.

Cam Height

Standard:

Exhaust 35.743 ~ 35.857 mm (1.4072 ~ 1.4117 in.)

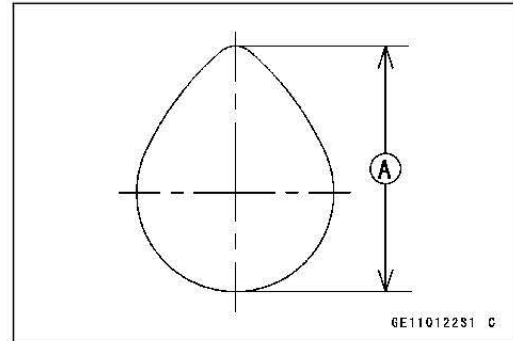
Intake 35.743 ~ 35.857 mm (1.4072 ~ 1.4117 in.)

Service Limit:

Exhaust 35.64 mm (1.403 in.)

Intake 35.64 mm (1.403 in.)

- ★ If the cams are worn down past the service limit, replace the camshaft.



Cylinder Head

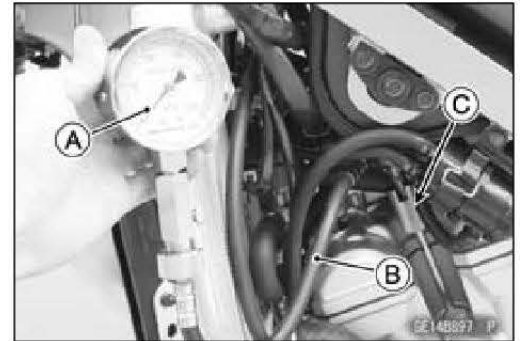
Cylinder Compression Measurement

NOTE

○ Use the battery which is fully charged.

- Warm up the engine thoroughly.
- Stop the engine.
- Remove:
 - Left Shroud (see Shroud Removal(15-10))
 - Spark Plug (see Spark Plug Cleaning and Inspection(16-40))
- Attach the compression gauge [A], hose [B] and adapter [C] firmly into the spark plug hole.
- Using the starter motor, turn the engine over with the throttle fully open until the compression gauge stops rising; the compression is the highest reading obtainable.

Special Tools - Compression Gauge, 20 kgf/cm²: 57001-221
L-Shape Hose: 57001-1606
Compression Gauge Adapter, M10 × 1.0: 57001-1601



Cylinder Compression

Usable Range: 1 113 ~ 1 688 kPa (11.35 ~ 17.22
 kgf/cm², 161.4 ~ 244.8 psi) @960 r/min
 (rpm)

- Install the spark plug (see Spark Plug Cleaning and Inspection(16-40)).

○ The following table should be consulted if the obtainable compression reading is not within the usable range.

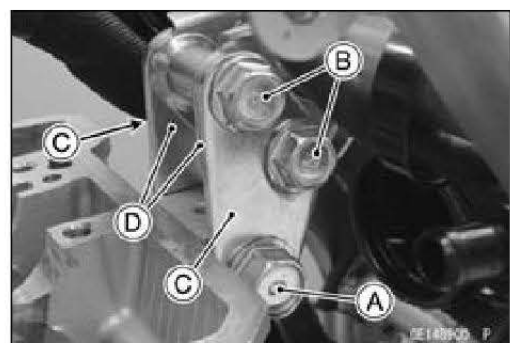
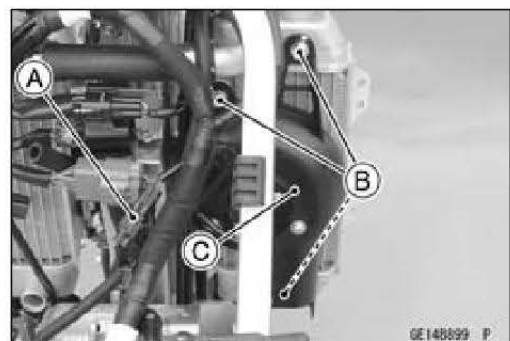
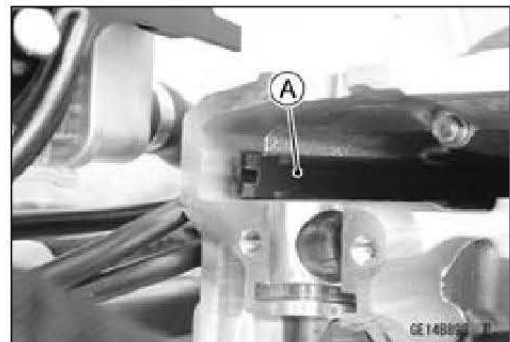
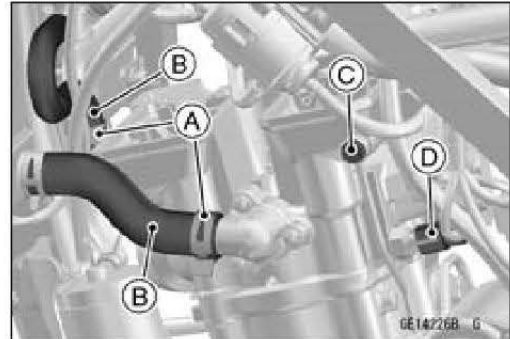
Problem	Diagnosis	Remedy (Action)
Cylinder compression is higher than usable range.	Carbon accumulation on piston and in combustion chamber possibly due to damaged valve stem oil seal and/or damaged piston oil rings (This may be indicated by white exhaust smoke).	Remove the carbon deposits and replace damaged parts if necessary.
	Incorrect cylinder head gasket thickness	Replace the gasket with a standard part.
Cylinder compression is lower than usable range.	Gas leakage around cylinder head	Replace damaged gasket and check cylinder head warp.
	Bad condition of valve seating	Repair if necessary.
	Incorrect valve clearance	Adjust the valve clearance.
	Incorrect piston/cylinder clearance	Replace the piston and/or cylinder.
	Piston seizure	Inspect the cylinder and replace/repair the cylinder and/or piston as necessary.
	Bad condition of piston ring and/or piston ring grooves	Replace the piston and/or the piston rings.

5-26 ENGINE TOP END

Cylinder Head

Cylinder Head Removal

- Drain:
Coolant (see Coolant Change(2-25))
 - Remove:
Camshaft (see Camshaft Removal(5-18))
Exhaust Pipe (see Exhaust Pipe Removal(5-43))
Throttle Body Assy (see Throttle Body Assy Removal(3-108))
 - Slide the clamps [A] and disconnect the hoses [B].
 - Remove:
Oil Pipe Banjo Bolt [C]
Washers
 - Disconnect the water temperature sensor connector [D].
-
- Remove the front camshaft chain guide [A].
-
- Disconnect the radiator fan connector [A].
 - Remove:
Radiator Fan Bolts [B]
Radiator Fan [C]
-
- Remove:
Upper Engine Mounting Bolt [A] and Nut
Upper Engine Bracket Bolts [B]
Upper Engine Brackets [C] and Plates [D]

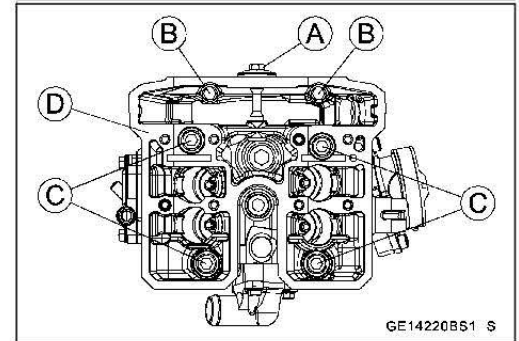


Cylinder Head

- Remove:
 - Cylinder Head Damper Bolt [A]
 - Cylinder Head Bolts (M6) [B]
 - Cylinder Head Bolts (M10) [C] and Washers
 - Cylinder Head [D]

NOTE

○ If the cylinder head is hard to remove, tap it with a plastic hammer.

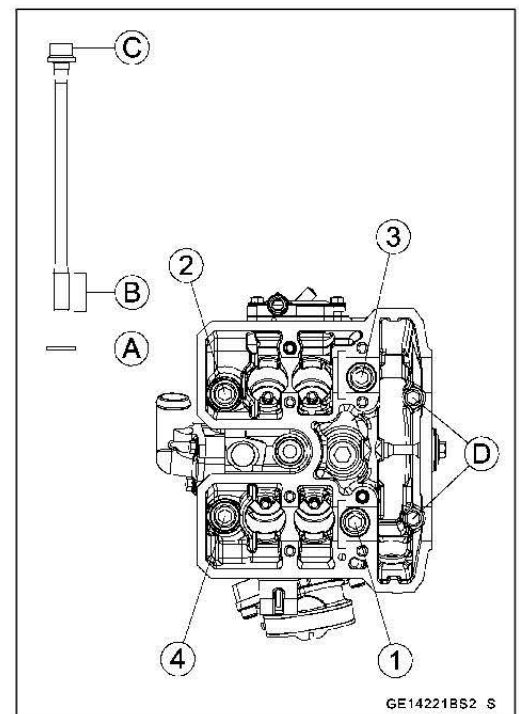
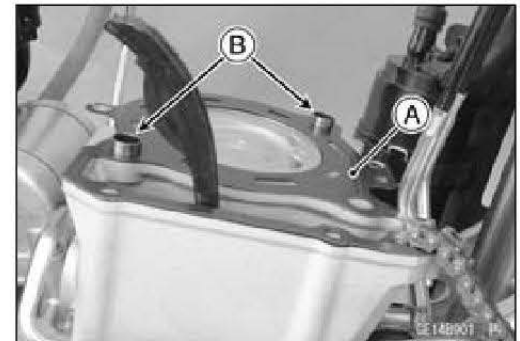


Cylinder Head Installation

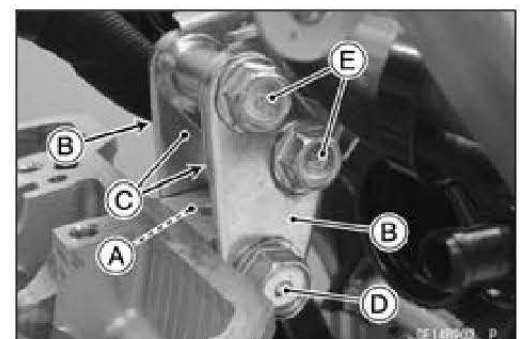
NOTE

○ The camshaft cap is machined with the cylinder head, so if a new cylinder head is installed, use the cap that is supplied with the new head.

- Replace the gasket [A] with a new one.
- Install:
 - Gasket
 - Dowel Pins [B]
 - Cylinder Head
- Apply molybdenum disulfide grease to both surfaces of the washers [A] and threads [B] of the cylinder head bolts (M10) [C].
- Install the washers.
- Tighten the cylinder head bolts (M10) following the specified tightening sequence [1 ~ 4].
 - Torque - Cylinder Head Bolts (M10, First): 15 N·m (1.5 kgf·m, 11 ft·lb)**
 - Cylinder Head Bolts (M10, Final): 46 N·m (4.7 kgf·m, 34 ft·lb)**
- Tighten:
 - Torque - Cylinder Head Bolts (M6) [D]: 12 N·m (1.2 kgf·m, 106 in·lb)**



- Replace the upper engine mounting nut [A] with a new one.
- Install the following parts temporarily.
 - Upper Engine Brackets [B] and Plates [C]
 - Upper Engine Mounting Bolt [D] and Nut
 - Upper Engine Bracket Bolts [E]



5-28 ENGINE TOP END

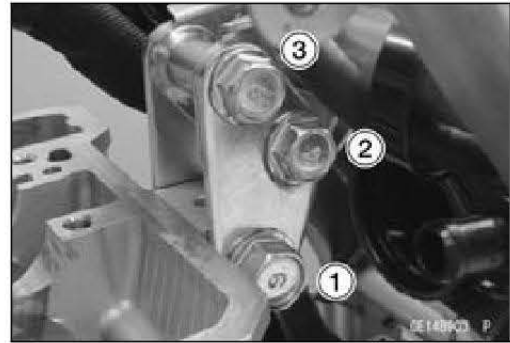
Cylinder Head

- Tighten the upper engine mounting bolt and upper engine bracket bolts following the specified tightening sequence [1 ~ 3].

Torque - Upper Engine Mounting Bolt: 50 N·m (5.1 kgf·m, 37 ft·lb)

Upper Engine Bracket Bolts: 23 N·m (2.3 kgf·m, 17 ft·lb)

- Install the removed parts.



Cylinder Head Warp Inspection

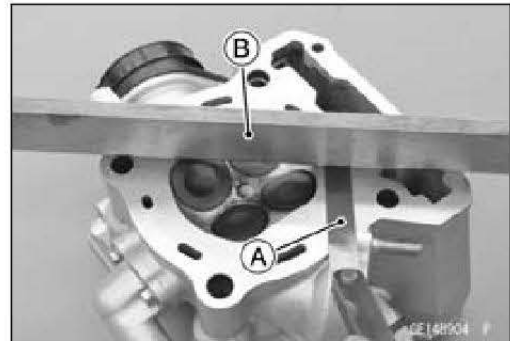
- Clean the cylinder head.
- Lay a straightedge across the lower surface of the cylinder head at several positions.
- Using a thickness gauge [A], measure the space between the straightedge [B] and the head.

Cylinder Head Warp

Standard: — — —

Service Limit: 0.05 mm (0.002 in.)

- ★ If the cylinder head is warped more than the service limit, replace it.
- ★ If the cylinder head is warped less than the service limit, repair the head by rubbing the lower surface on emery paper secured to a surface plate (first No. 200, then No. 400).



Valves

Valve Clearance Inspection

- Refer to the Valve Clearance Inspection (see [Valve Clearance Inspection\(2-29\)](#)).

Valve Clearance Adjustment

- Refer to the Valve Clearance Adjustment (see [Valve Clearance Adjustment\(2-29\)](#)).

Valve Removal

- Remove:
 - Cylinder Head (see [Cylinder Head Removal\(5-26\)](#))
 - Valve Lifter and Shim

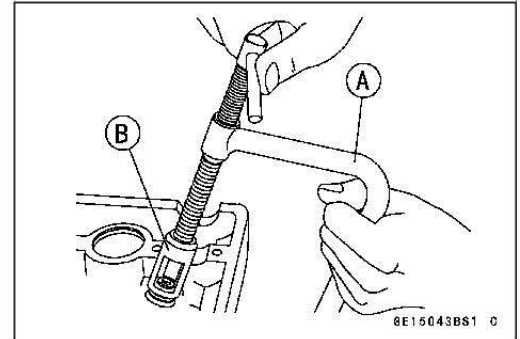
NOTE

○Mark and record the valve lifter and shim locations so they can be installed in their original positions.

- Using the valve spring compressor assembly [A] and adapter [B], remove the valve.

Special Tools - Valve Spring Compressor Assembly: 57001-241

Valve Spring Compressor Adapter, $\phi 24$: 57001-1586



Valve Installation

- Apply a thin coat of molybdenum disulfide grease to the inside of the valve guide.
- Replace the valve stem oil seal [A] with a new one and apply engine oil to it.

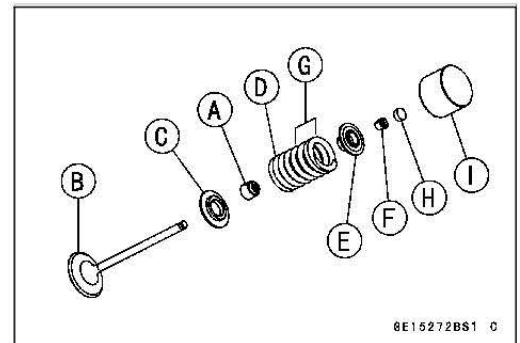
- Install:
 - Valve [B]
 - Valve Stem Oil Seal
 - Spring Seat [C]
 - Valve Spring [D]
 - Retainer [E]
 - Split Keepers [F]

○The painted side [G] of the valve spring faces upward.

Special Tools - Valve Spring Compressor Assembly: 57001-241

Valve Spring Compressor Adapter, $\phi 24$: 57001-1586

- Install the shim [H] and valve lifter [I] to the original position.
- Install:
 - Cylinder Head (see [Cylinder Head Installation\(5-27\)](#))



5-30 ENGINE TOP END

Valves

Valve Guide Removal

- Remove:
 - Valve (see Valve Removal(5-29))
 - Valve Stem Oil Seal
 - Spring Seat
- Heat the area around the valve guide to 120 ~ 150°C (248 ~ 302°F), and hammer lightly on the valve guide arbor [A] to remove the guide from the top of the head.

NOTICE

Do not heat the cylinder head with a torch. This will warp the cylinder head. Soak the cylinder head in oil and heat the oil.

Special Tool - Valve Guide Arbor, $\phi 4.5$: 57001-1331

Valve Guide Installation

- Apply engine oil to the valve guide outer surface before installation.
- Heat the area around the valve guide hole to about 120 ~ 150°C (248 ~ 302°F).

NOTICE

Do not heat the cylinder head with a torch. This will warp the cylinder head. Soak the cylinder head and heat the oil.

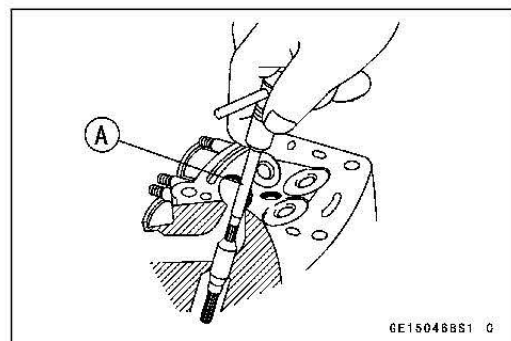
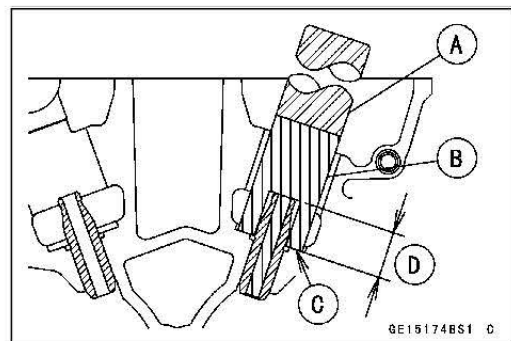
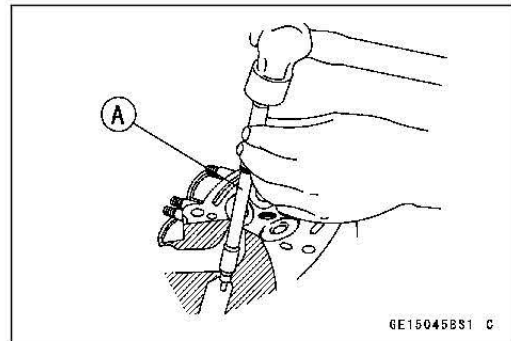
- Using the valve guide driver [A] and attachment [B], press and insert the valve guide in until the attachment bottom surface touches the head surface [C].
15.3 ~ 15.5 mm (0.602 ~ 0.610 in.) [D]

Special Tools - Valve Guide Driver: 57001-1564

Valve Guide Driver Attachment, F: 57001-1722

- Ream the valve guide with valve guide reamer [A], even if the old guide is reused.

Special Tool - Valve Guide Reamer, $\phi 4.5$: 57001-1333

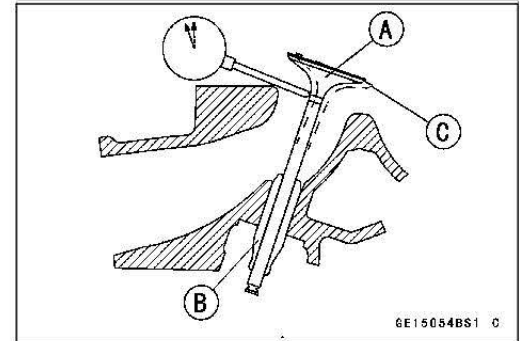


Valves

Valve-to-Guide Clearance Measurement (Wobble Method)

If a small bore gauge is not available, inspect the valve guide wear by measuring the valve to valve guide clearance with the wobble method as indicated below.

- Insert a new valve [A] into the guide [B] and set a dial gauge against the stem perpendicular to it as close as possible to the cylinder head mating surface.
- Move the stem back and forth [C] to measure valve/valve guide clearance.
- Repeat the measurement in a direction at a right angle to the first.



Valve/Valve Guide Clearance (Wobble Method)

Standard:

Exhaust	0.08 ~ 0.15 mm (0.0031 ~ 0.0059 in.)
Intake	0.03 ~ 0.10 mm (0.0012 ~ 0.0039 in.)

Service Limit:

Exhaust	0.33 mm (0.013 in.)
Intake	0.28 mm (0.011 in.)

NOTE

○The reading is not actual valve/valve guide clearance because the measuring point is above the guide.

★If the reading exceeds the service limit, replace the guide.

Valve Seat Inspection

- Remove the valve (see Valve Removal(5-29)).
- Check the valve seating surface [A] between the valve [B] and valve seat [C].
- Measure the outside diameter [D] of the seating pattern on the valve seat.

Valve Seating Surface Outside Diameter

Standard:

Exhaust	24.4 ~ 24.6 mm (0.96 ~ 0.97 in.)
Intake	28.4 ~ 28.6 mm (1.12 ~ 1.13 in.)

★If the outside diameter is too large or too small, repair the seat (see Valve Seat Repair(5-32)).

○Measure the seat width [E] of the portion where there is no build-up carbon (white portion) of the valve seat with a vernier caliper.

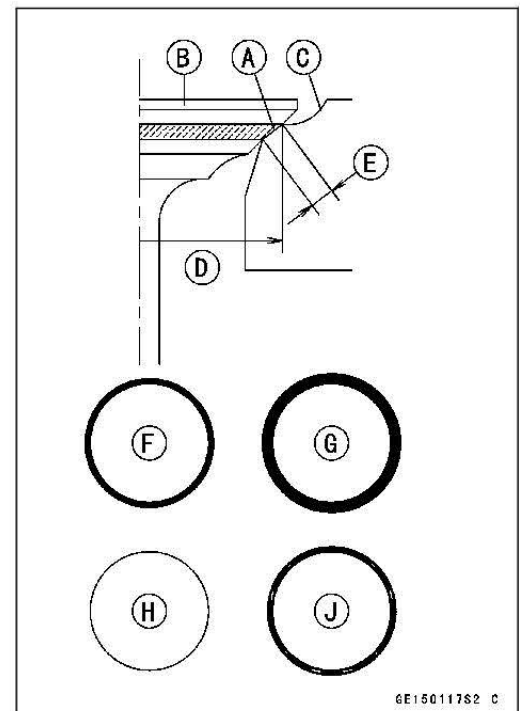
Good [F]

Valve Seating Surface Width

Standard:

Exhaust	0.5 ~ 1.0 mm (0.020 ~ 0.039 in.)
Intake	0.5 ~ 1.0 mm (0.020 ~ 0.039 in.)

★If the width is too wide [G], too narrow [H] or uneven [J], repair the seat (see Valve Seat Repair(5-32)).



5-32 ENGINE TOP END

Valves

Valve Seat Repair

- Repair the valve seat with the valve seat cutters [A].

Special Tools - Valve Seat Cutter Holder Bar [B]: 57001-1128

Valve Seat Cutter Holder, $\phi 4.5$ [C]: 57001-1330

[For Exhaust Valve Seat]

Valve Seat Cutter, 45° - $\phi 27.5$: 57001-1114

Valve Seat Cutter, 32° - $\phi 28$: 57001-1119

Valve Seat Cutter, 60° - $\phi 25$: 57001-1328

[For Intake Valve Seat]

Valve Seat Cutter, 45° - $\phi 30$: 57001-1187

Valve Seat Cutter, 32° - $\phi 30$: 57001-1120

Valve Seat Cutter, 60° - $\phi 30$: 57001-1123

- ★ If the manufacturer's instructions are not available, use the following procedure.

Seat Cutter Operation Care

1. This valve seat cutter is developed to grind the valve for repair. Therefore the cutter must not be used for other purposes than seat repair.
2. Do not drop or shock the valve seat cutter, or the diamond particles may fall off.
3. Do not fail to apply engine oil to the valve seat cutter before grinding the seat surface. Also wash off ground particles sticking to the cutter with washing oil.

NOTE

○ Do not use a wire brush to remove the metal particles from the cutter. It will take off the diamond particles.

4. Setting the valve seat cutter holder in position, operate the cutter in one hand. Do not apply too much force to the diamond portion.

NOTE

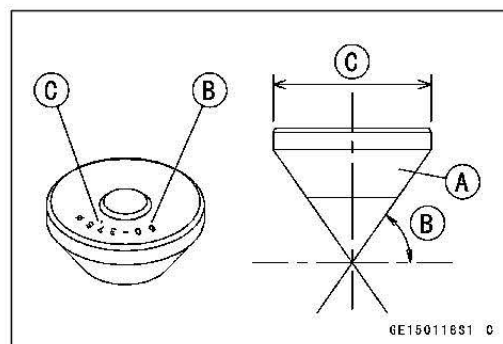
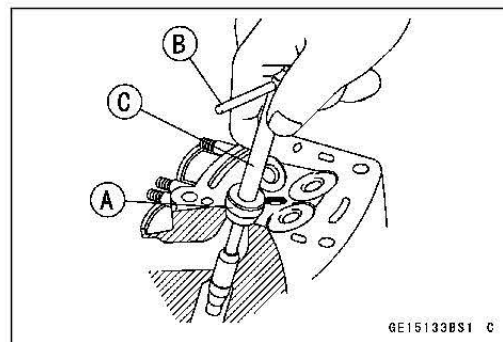
○ Prior to grinding, apply engine oil to the cutter and during the operation, wash off any ground particles sticking to the cutter with washing oil.

5. After use, wash it with washing oil and apply thin layer of engine oil before storing.

Marks Stamped on the Cutter

The marks stamped on the back of the cutter [A] represent the following.

- 60° Cutter angle [B]
37.5 ϕ Outer diameter of cutter [C]



Valves

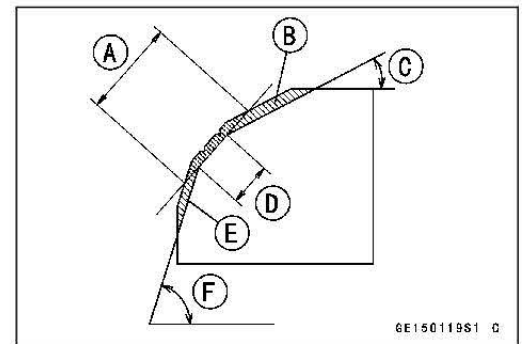
Operating Procedures

- Clean the seat area carefully.
- Coat the seat with machinist's dye.
- Fit a 45° cutter into the holder and slide it into the valve guide.
- Press down lightly on the handle and turn it right or left. Grind the seating surface only until it is smooth.

NOTICE

Do not grind the seat too much. Overgrinding will reduce valve clearance by sinking the valve into the head. If the valve sinks too far into the head, it will be impossible to adjust the clearance, and the cylinder head must be replaced.

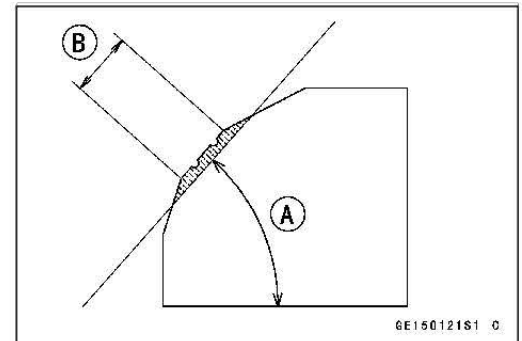
- Measure the outside diameter of the seating surface with a vernier caliper.
- ★ If the outside diameter of the seating surface is too small, repeat the 45° grind until the diameter is within the specified range.
 - Widened Width [A] of engagement by machining with 45° cutter
 - Ground Volume [B] by 32° cutter
 - 32° [C]
 - Correct Width [D]
 - Ground Volume [E] by 60° cutter
 - 60° [F]



- Measure the outside diameter of the seating surface with a vernier caliper.
- ★ If the outside diameter of the seating surface is too small, repeat the 45° [A] grind until the diameter is within the specified range.
 - Original Seating Surface [B]

NOTE

- Remove all pittings of flaws from 45° ground surface.
- After grinding with 45° cutter, apply thin coat of machinist's dye to seating surface. This makes seating surface distinct and 32° and 60° grinding operation easier.
- When the valve guide is replaced, be sure to grind with 45° cutter for centering and good contact.



5-34 ENGINE TOP END

Valves

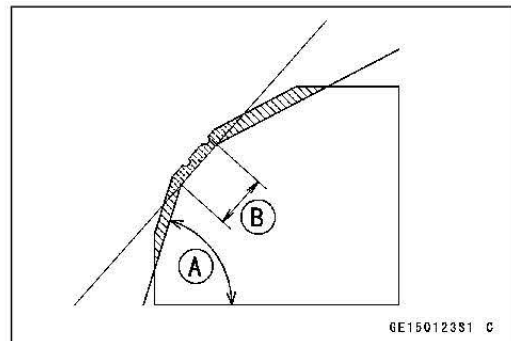
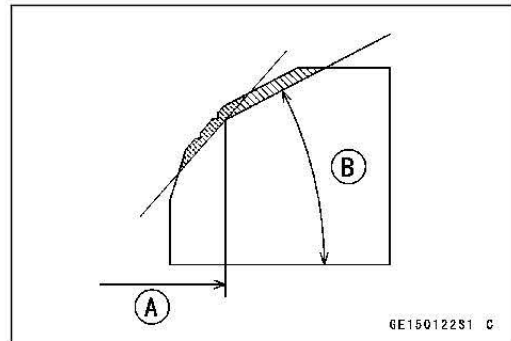
- ★ If the outside diameter [A] of the seating surface is too large, make the 32° [B] grind described below.
- ★ If the outside diameter of the seating surface is within the specified range, measure the seat width as described below.
- Grind the seat at a 32° angle until the seat outside diameter is within the specified range.
- To make the 32° grind, fit a 32° cutter into the holder, and slide it into the valve guide.
- Turn the holder one turn at a time while pressing down very lightly. Check the seat after each turn.

NOTICE

The 32° cutter removes material very quickly. Check the seat outside diameter frequently to prevent overgrinding.

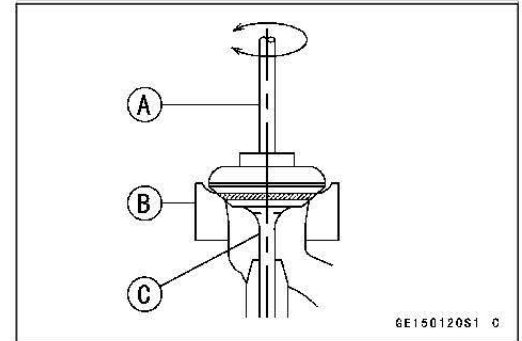
- After making the 32° grind, return to the seat outside diameter measurement step above.
- To measure the seat width, use a vernier caliper to measure the width of the 45° angle portion of the seat at several places around the seat.
- ★ If the seat width is too narrow, repeat the 45° grind until the seat is slightly too wide, and then return to the seat outside diameter measurement step above.

- ★ If the seat width is too wide, make the 60° [A] grind described below.
 - ★ If the seat width is within the specified range, lap the valve to the seat as described below.
 - Grind the seat at a 60° angle until the seat width is within the specified range.
 - To make the 60° grind, fit 60° cutter into the holder, and slide it into the valve guide.
 - Turn the holder, while pressing down lightly.
 - After making the 60° grind, return to the seat width measurement step above.
- Correct Width [B]

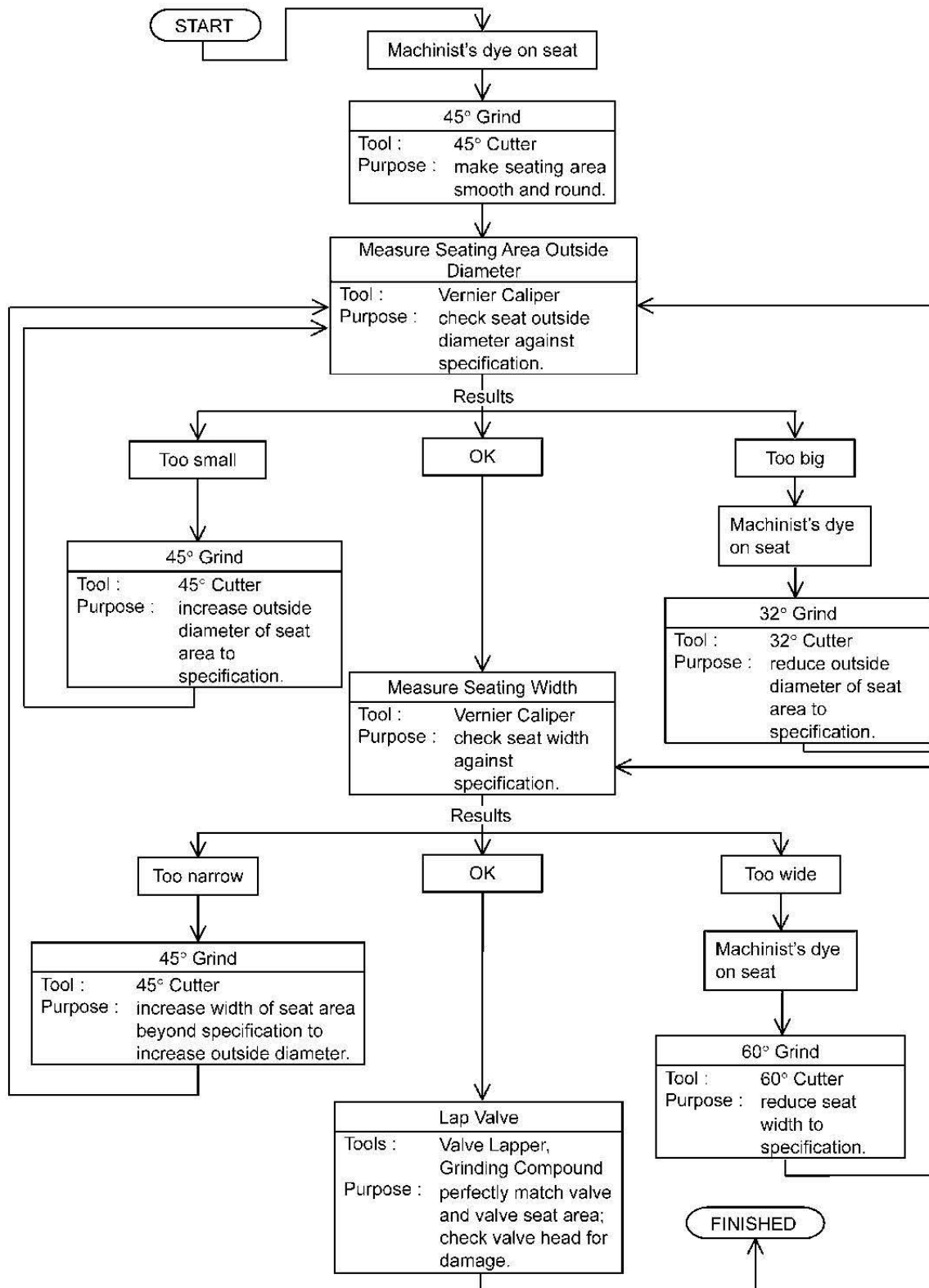


Valves

- Lap the valve to the valve seat, once the seat width and outside diameter are within the ranges specified above.
- Put a little coarse grinding compound on the face of the valve in a number of places around the valve head.
- Spin the valve against the seat until the grinding compound produces a smooth, matched surface on both the seat and the valve.
- Repeat the process with a fine grinding compound.
 - Lapper [A]
 - Valve Seat [B]
 - Valve [C]
- The seating area should be marked about in the middle of the valve face.
- ★ If the seat area is not in the right place on the valve, check to be sure the valve is the correct part. If it is, it may have been refaced too much; replace it.
- Be sure to remove all grinding compound before assembly.
- When the engine is assembled, be sure to adjust the valve clearance (see Valve Clearance Inspection(2-29)).



Valve Seat Repair



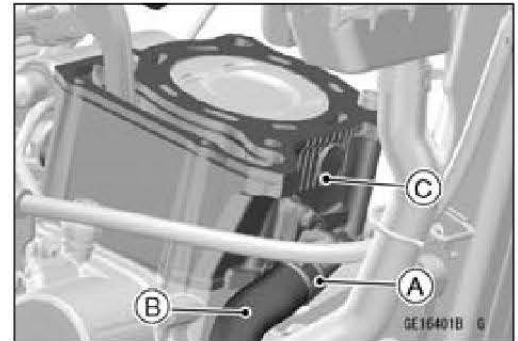
Cylinder, Piston

Cylinder Removal

- Remove:
Cylinder Head (see [Cylinder Head Removal\(5-26\)](#))
- Slide the clamp [A], and disconnect the water hose [B].
- Remove:
Cylinder [C]

NOTE

○If the cylinder is hard to removing, tap it with a plastic hammer.



Cylinder Installation

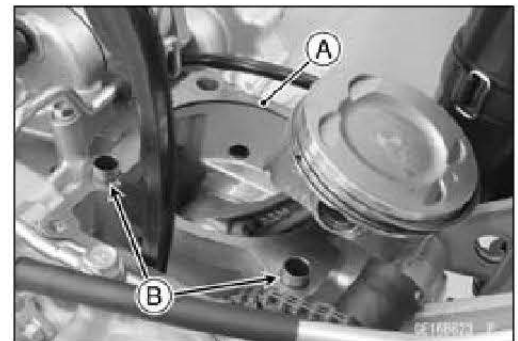
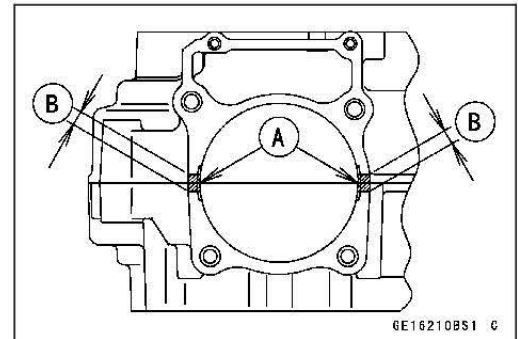
NOTE

○If a new cylinder is used, use new piston rings.

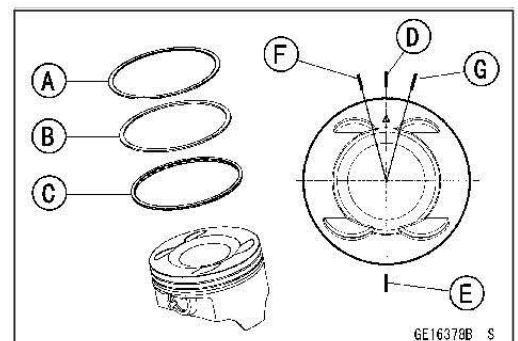
- Using a high flash-point solvent, clean off any oil or dirt that may be on the liquid gasket coating area. Dry them with a clean cloth.
- Apply liquid gasket to the upper surface [A] of the crankcase mating surface.
About 10 mm (0.39 in.) [B]

Sealant - Liquid Gasket, TB1211F: 92104-0004

- Replace the cylinder gasket [A] with a new one.
- Install:
Cylinder Gasket
Dowel Pins [B]



- The piston ring openings must be positioned as shown.
Top Ring [A]
Second Ring [B]
Oil Ring [C]
Top Ring Opening [D]
Second Ring and Oil Ring Expander Opening [E]
Oil Ring Lower Rail Opening [F]
Oil Ring Upper Rail Opening [G]

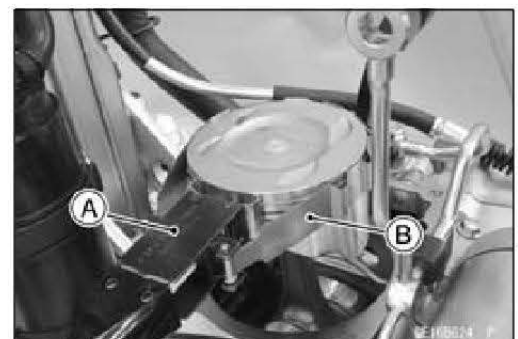


- Apply molybdenum disulfide oil solution to the cylinder bore and piston skirt.
- Compress the piston ring with the piston ring compressor or fingers.

Special Tools - Piston Ring Compressor Grip [A]: 57001-1095

Piston Ring Compressor Belt, $\phi 67 \sim \phi 79$ [B]: 57001-1097

- Install the piston into the cylinder.
- Install:
Cylinder Head (see [Cylinder Head Installation\(5-27\)](#))

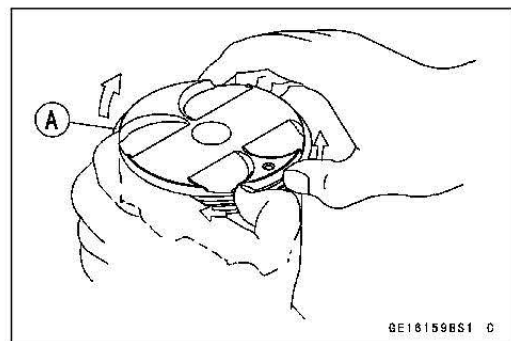


5-38 ENGINE TOP END

Cylinder, Piston

Piston Removal

- Remove:
 - Cylinder (see [Cylinder Removal\(5-37\)](#))
- Place a clean cloth under the piston.
- Remove the piston pin snap ring [A].
- Using the piston pin puller assembly [A], remove the piston pin.
- Remove the piston.
- Carefully spread the ring opening with your thumbs and then push up on the opposite side of the ring [A] to remove it.
- Remove the 3-piece oil ring with your thumbs in the same manner.



Piston Installation

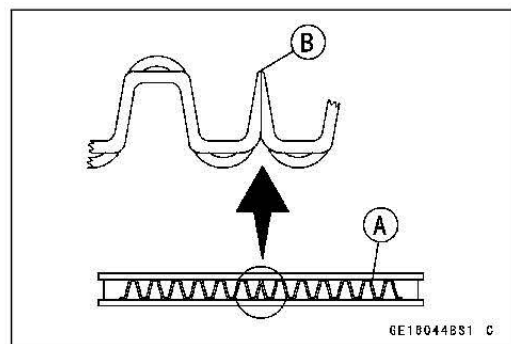
NOTE

○If a new piston is used, use new piston rings.

- Apply engine oil to the oil ring expander, and install the oil ring expander [A] in the bottom piston ring groove so the ends [B] not butt together.
- Apply engine oil to the oil ring steel rails, and install the oil ring steel rails, one above the expander and one below it.
- Spread the rail with your thumbs, but only enough to fit the rail over the piston.
- Release the rail into the bottom piston ring groove.

NOTE

○The oil ring steel rails have no "top" or "bottom."



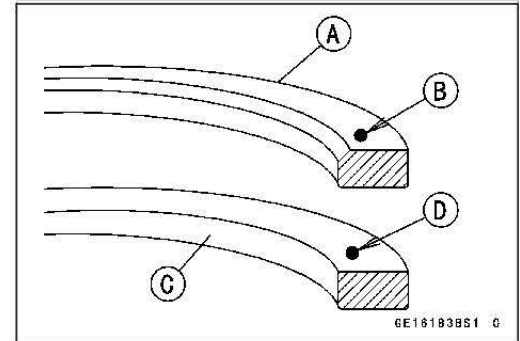
Cylinder, Piston

- Apply engine oil to the piston rings.

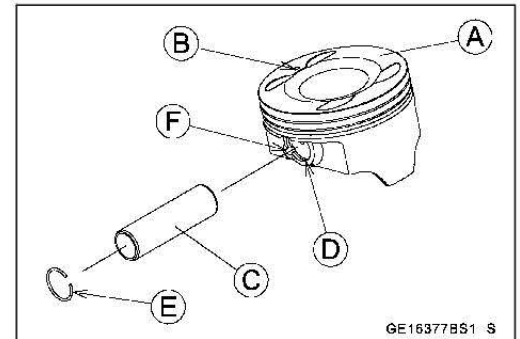
NOTE

○Do not mix up the top and second ring.

- Install the top ring [A] so that the "1R" mark [B] faces up.
- Install the second ring [C] so that the "2R" mark [D] faces up.
- Check that the piston rings and the oil ring move smoothly.



- Install the piston [A] with its dent mark [B] facing forward.
 - Apply molybdenum disulfide oil solution to the piston pin [C] and piston journal [D].
 - Fit a new piston pin snap ring into the side of the piston so that the ring opening [E] does not coincide with the slit [F] of the piston pin hole.
- When installing the piston pin snap ring, compress it only enough to install it and no more.



NOTICE

Do not reuse the piston pin snap ring, as removal weakens and deforms them. They could fall out and score the cylinder wall.

- Install the cylinder (see [Cylinder Installation\(5-37\)](#)).

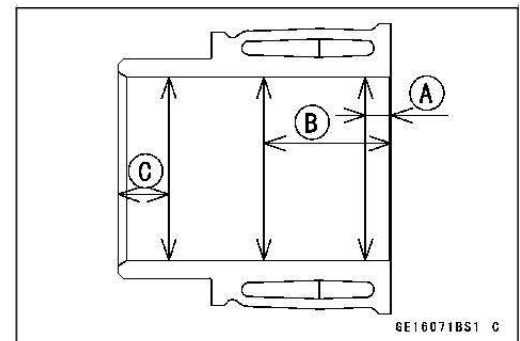
Cylinder Wear Inspection

- Since there is a difference in cylinder wear in different directions, take a side-to-side and a front-to-back measurement at each of the three locations (total of six measurements) as shown.

10 mm (0.39 in.) [A]

50 mm (1.97 in.) [B]

20 mm (0.79 in.) [C]



Cylinder Inside Diameter

Standard: 78.000 ~ 78.012 mm (3.0709 ~ 3.0713 in.)

Service Limit: 78.06 mm (3.073 in.)

- ★ If any of the cylinder inside diameter measurements exceeds the service limit, replace the cylinder.

Piston Wear Inspection

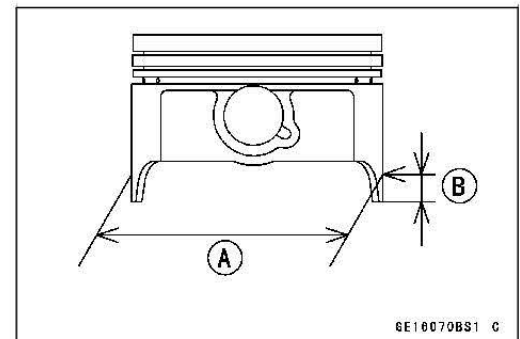
- Measure the piston outside diameter [A] 15 mm (0.59 in.) [B] up from the bottom of the piston at a right angle to the direction of the piston pin.

Piston Diameter

Standard: 77.950 ~ 77.965 mm (3.0689 ~ 3.0695 in.)

Service Limit: 77.80 mm (3.063 in.)

- ★ If the piston diameter is less than the service limit, replace the piston with a new one.



5-40 ENGINE TOP END

Cylinder, Piston

Piston Ring, Piston Ring Groove Wear Inspection

- Check for uneven groove wear by inspecting the ring seating.
- ★ The rings should fit perfectly parallel to groove surfaces. If not, replace the piston and all the piston rings.
- With the piston rings in their grooves, make several measurements with a thickness gauge [A] to determine piston ring/groove clearance.

Piston Ring/Groove Clearance

Standard:

Top	0.030 ~ 0.070 mm (0.00118 ~ 0.00276 in.)
Second	0.030 ~ 0.070 mm (0.00118 ~ 0.00276 in.)

Service Limit:

Top	0.17 mm (0.0067 in.)
Second	0.17 mm (0.0067 in.)

Piston Ring Groove Width Inspection

- Measure the piston ring groove width.
- Use a vernier caliper at several points around the piston.

Piston Ring Groove Width

Standard:

Top [A]	1.02 ~ 1.04 mm (0.0402 ~ 0.0409 in.)
Second [B]	1.02 ~ 1.04 mm (0.0402 ~ 0.0409 in.)

Service Limit:

Top	1.12 mm (0.0441 in.)
Second	1.12 mm (0.0441 in.)

- ★ If the width of any of the two grooves are wider than the service limit at any point, replace the piston.

Piston Ring Thickness Inspection

- Measure the piston ring thickness.
- Use the micrometer to measure at several points around the ring.

Piston Ring Thickness

Standard:

Top [A]	0.97 ~ 0.99 mm (0.038 ~ 0.039 in.)
Second [B]	0.97 ~ 0.99 mm (0.038 ~ 0.039 in.)

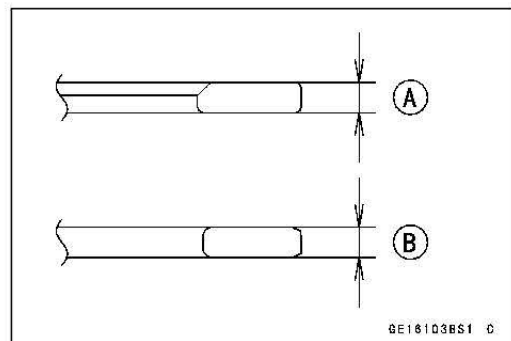
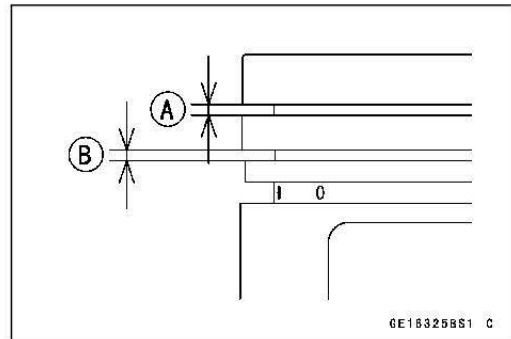
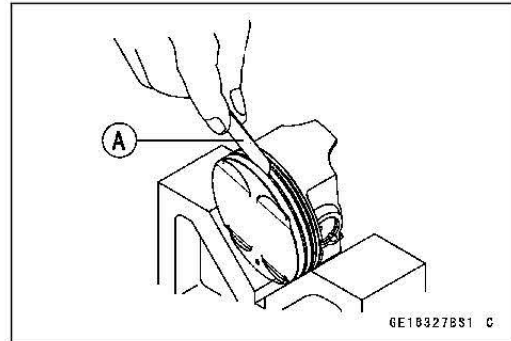
Service Limit:

Top	0.90 mm (0.035 in.)
Second	0.90 mm (0.035 in.)

- ★ If any of the measurements is less than the service limit on either of the rings, replace all the rings.

NOTE

- When using new rings in a used piston, check for uneven groove wear. The rings should fit perfectly parallel to the groove sides. If not, replace the piston.



Cylinder, Piston

Piston Ring End Gap Inspection

- Place the piston ring [A] inside the cylinder, using the piston to locate the ring squarely in place. Set it close to the bottom of the cylinder, where cylinder wear is low.
- Measure the gap [B] between the ends of the ring with a thickness gauge.

Piston Ring End Gap

Standard:

Top **0.20 ~ 0.35 mm (0.0079 ~ 0.0138 in.)**

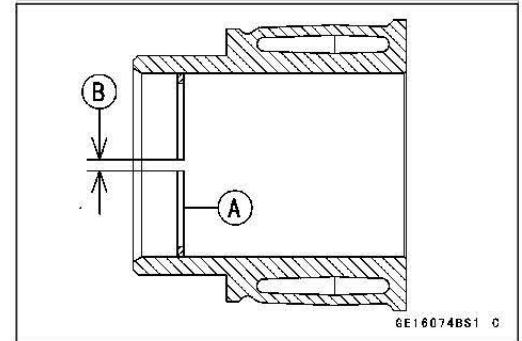
Second **0.20 ~ 0.40 mm (0.0079 ~ 0.0157 in.)**

Service Limit:

Top **0.7 mm (0.03 in.)**

Second **0.7 mm (0.03 in.)**

- ★ If the end gap of either ring is greater than the service limit, replace all the rings.

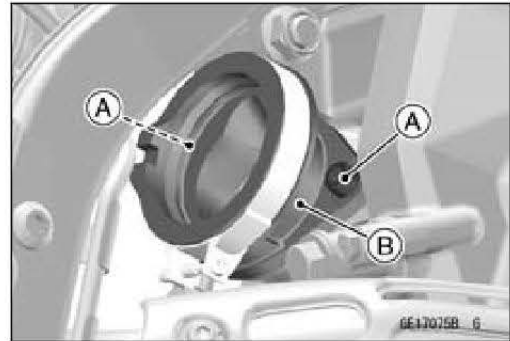


5-42 ENGINE TOP END

Throttle Body Assy Holder

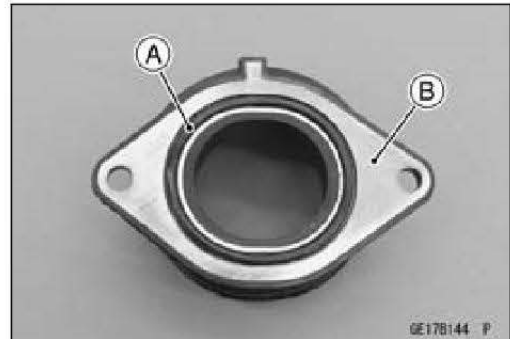
Throttle Body Assy Holder Removal

- Remove:
 - Throttle Body Assy (see Throttle Body Assy Removal(3-108))
 - Throttle Body Assy Holder Bolts [A]
 - Throttle Body Assy Holder [B]

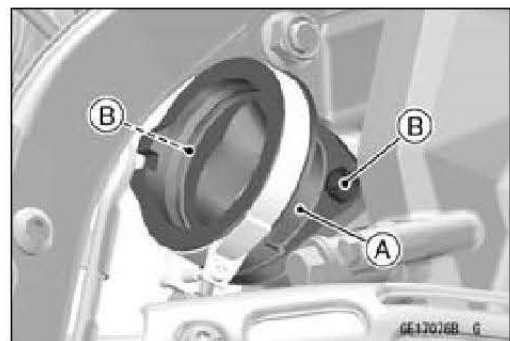


Throttle Body Assy Holder Installation

- Replace the O-ring [A] with a new one.
- To prevent falling, apply grease to the O-ring.
- Install the O-ring to the throttle body assy holder [B].



- Install:
 - Throttle Body Assy Holder [A]
- Tighten:
 - Torque - Throttle Body Assy Holder Bolts [B]: 12 N·m (1.2 kgf·m, 106 in·lb)**
- Install the removed parts.



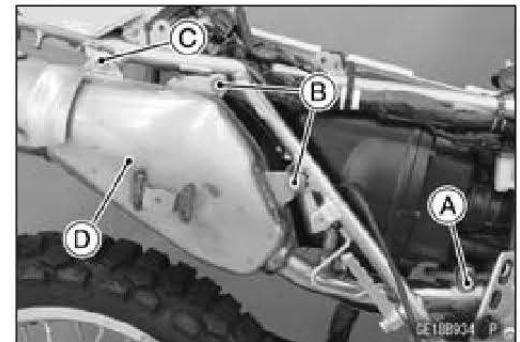
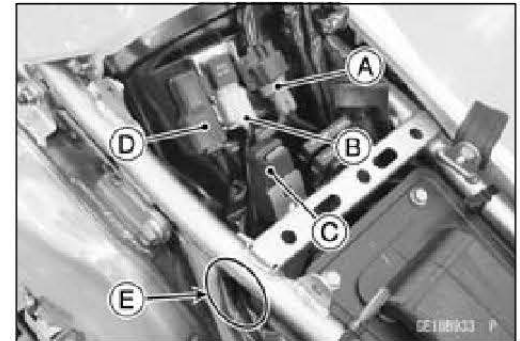
Muffler

WARNING

The exhaust pipe or muffler body can become extremely hot during normal operation and cause severe burns. Do not remove the exhaust pipe or muffler body while it is hot.

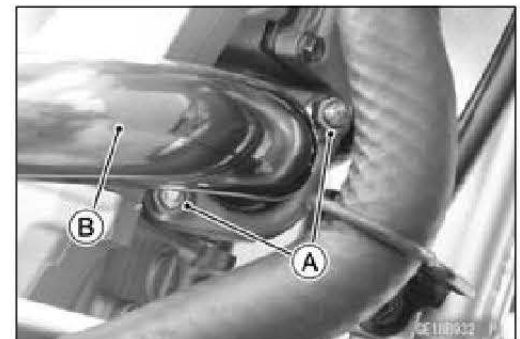
Muffler Body Removal

- Remove:
 - Seat (see [Seat Removal \(15-7\)](#))
 - Right Side Cover (see [Side Cover Removal\(15-8\)](#))
- Disconnect:
 - Oxygen Sensor Lead Connector [A]
 - Diode Connector [B]
- Remove:
 - Radiator Fan Relay [C]
 - Starter Circuit Relay [D]
- Take out these main harness connectors from the space [E] of the frame.
- Loosen:
 - Muffler Body Clamp Bolt [A]
- Remove:
 - Muffler Body Bolts [B] and Washers
 - Muffler Body Bolt and Nut [C]
 - Muffler Body [D]



Exhaust Pipe Removal

- Remove:
 - Muffler Body (see [Muffler Body Removal\(5-43\)](#))
 - Exhaust Pipe Holder Nuts [A]
 - Exhaust Pipe [B]

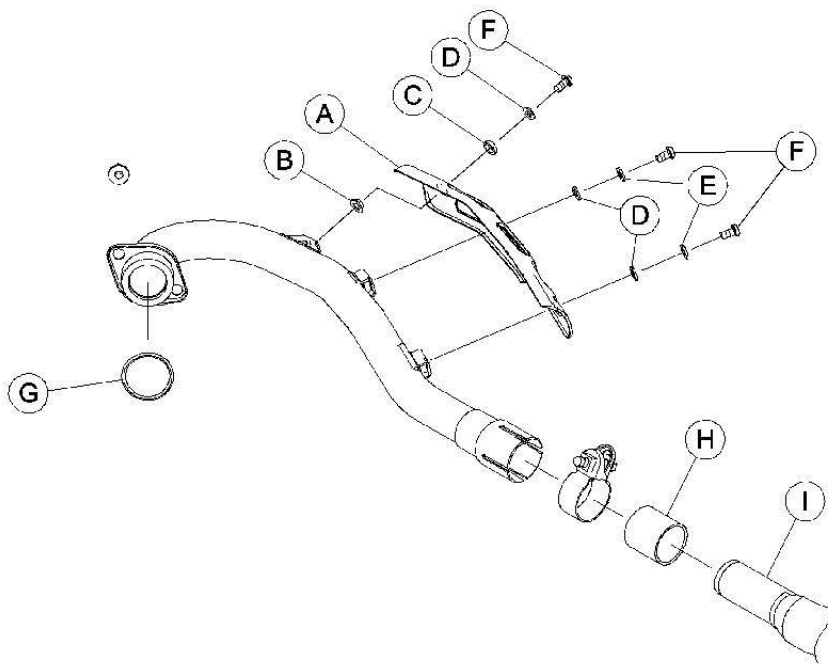


5-44 ENGINE TOP END

Muffler

Muffler Body and Exhaust Pipe Installation

- When installing the exhaust pipe cover [A], install the following parts.
 - Collar [B]
 - Washer [C] (T = 3)
 - Washers [D] (T = 1.6)
 - Spring Washers [E]
 - Exhaust Pipe Cover Bolts [F]
- Tighten:
 - Torque - Exhaust Pipe Cover Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)**
- Replace the exhaust pipe gasket [G] with a new one.
- Apply grease to the exhaust pipe gasket, and install it to the engine.
- Replace the muffler body gasket [H] with a new one.
- Install the muffler body gasket to the muffler body [I] so that the chamfer side faces muffler body.



Muffler

- Install the exhaust pipe [A] and muffler body [B] temporary.
- First, tighten the exhaust pipe holder nuts in the numbered sequence [1 ~ 2].

Torque - Exhaust Pipe Holder Nuts: 21 N·m (2.1 kgf·m, 15 ft·lb)

- Second, tighten the muffler body bolt (rear) [3].

Torque - Muffler Body Bolt (Rear): 9.8 N·m (1.0 kgf·m, 87 in·lb)

- Third, tighten the muffler body bolt (front) [4].

Torque - Muffler Body Bolt (Front): 30 N·m (3.1 kgf·m, 22 ft·lb)

- Fourth, tighten the muffler body bolt (center) [5].

Torque - Muffler Body Bolt (Center): 30 N·m (3.1 kgf·m, 22 ft·lb)

- Fifth, tighten the muffler body nut [6].

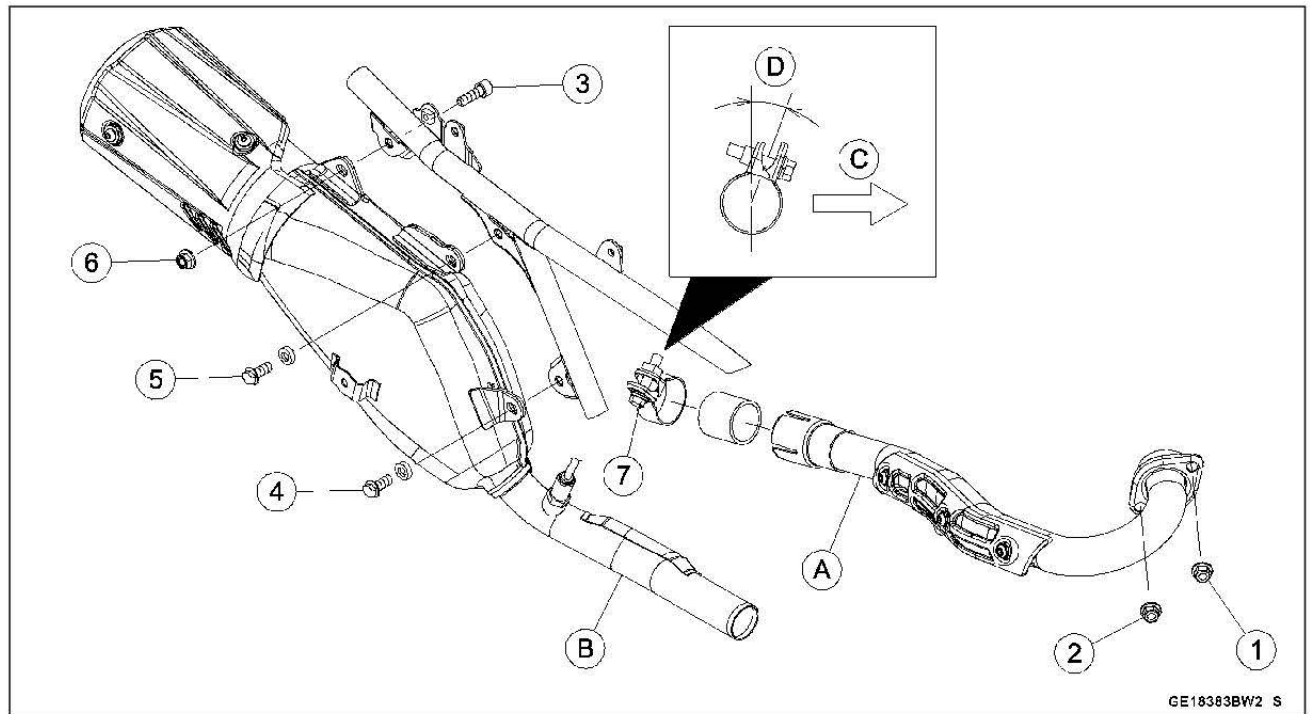
Torque - Muffler Body Nut: 40 N·m (4.1 kgf·m, 30 ft·lb)

- Lastly, tighten the muffler body clamp bolt [7] as shown.

Torque - Muffler Body Clamp Bolt: 10 N·m (1.0 kgf·m, 89 in·lb)

Right Side [C]

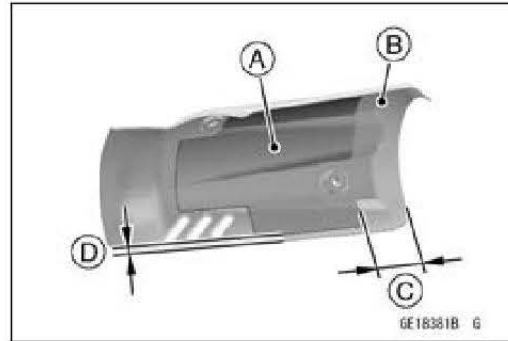
20° ~ 40° [D]



5-46 ENGINE TOP END

Muffler

- Stick the pad [A] to the muffler body cover [B] as shown, if necessary.
32 mm (1.3 in.) [C]
5 mm (0.2 in.) [D]

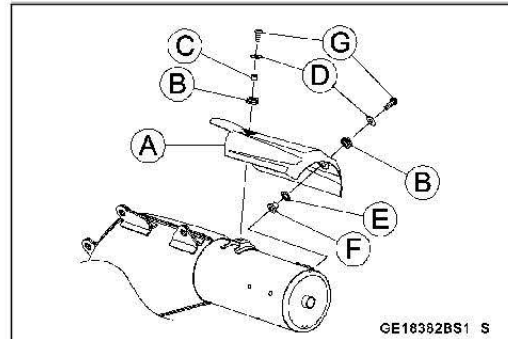


- If the muffler body cover [A] removed, install the following parts.
Dampers [B]
Collar [C]
Washers [D]
Gasket [E]
Collar [F]
Muffler Body Cover Bolts [G]

- Tighten:

Torque - Muffler Cover Bolts: 6.9 N·m (0.70 kgf·m, 61 in·lb)

- First, tighten the front side cover bolt, next tighten the rear side cover bolt.
- Thoroughly warm up the engine, wait until the engine cools down, and then retighten all the bolts and nuts.
- Install the removed parts.



Spark Arrester Cleaning (Equipped Models)

- Refer to the Spark Arrester Cleaning (see Spark Arrester Cleaning(2-32)).

Clutch

Table of Contents

Exploded View	6-2
Specifications	6-4
Special Tool	6-5
Clutch Lever and Cable	6-6
Clutch Lever Free Play Inspection	6-6
Clutch Lever Free Play Adjustment	6-6
Clutch Cable Removal	6-6
Clutch Cable Installation	6-6
Clutch Cable Lubrication	6-7
Clutch Lever Assembly Installation	6-7
Clutch Lever Removal	6-7
Clutch Lever Installation	6-7
Clutch Cover and Right Engine Cover	6-9
Clutch Cover Removal	6-9
Clutch Cover Installation	6-9
Right Engine Cover Removal	6-9
Right Engine Cover Installation	6-10
Right Engine Cover Assembly	6-11
Release Shaft Removal	6-12
Release Shaft Installation	6-12
Clutch Cover Damper Removal	6-12
Clutch Cover Damper Installation	6-12
Clutch	6-14
Clutch Removal	6-14
Clutch Installation	6-14
Clutch Plate Disassembly	6-16
Clutch Plate Assembly	6-16
Clutch Plate Assembly Inspection and Adjustment	6-18
Clutch Plate, Wear, Damage Inspection	6-18
Clutch Plate Warp Inspection	6-18
Clutch Housing Finger Inspection	6-19
Clutch Hub Spline Inspection	6-19
Clutch Spring Inspection	6-19

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Clutch Cable Holder Bolts	9.8	1.0	87 in·lb	S
2	Right Engine Cover Bolts (L = 70 mm)	9.8	1.0	87 in·lb	S
3	Clutch Cover Bolts	9.8	1.0	87 in·lb	S
4	Oil Seal Retaining Plate Bolt	12	1.2	106 in·lb	L
5	Clutch Cover Damper Plate Bolts	7.0	0.71	62 in·lb	L
6	Clutch Spring Bolts	5.0	0.51	44 in·lb	
7	Clutch Hub Nut	155	15.8	114	
8	Right Engine Cover Bolts (L = 25 mm)	9.8	1.0	87 in·lb	L (1), S
9	Right Engine Cover Bolt (L = 30 mm)	9.8	1.0	87 in·lb	S

10. KLX300D

CL: Apply cable lubricant.

EO: Apply engine oil.

G: Apply grease.

L: Apply a non-permanent locking agent.

M: Apply molybdenum disulfide grease.

MO: Apply molybdenum disulfide oil solution.

(mixture of the engine oil and molybdenum disulfide grease in a weight ratio 10:1)

R: Replacement Parts

S: Follow the specified tightening sequence.

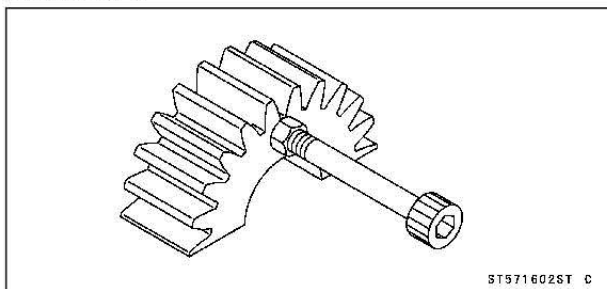
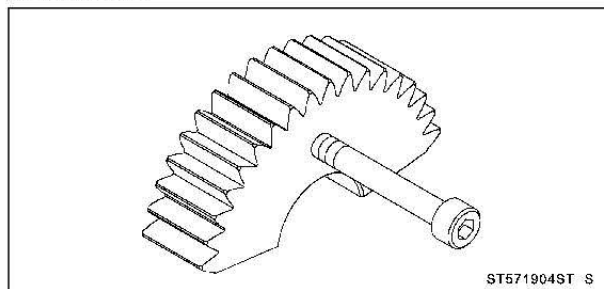
Si: Apply silicone grease.

WL: Apply soap and water solution or rubber lubricant.

6-4 CLUTCH

Specifications

Item	Standard	Service Limit
Clutch Lever and Cable		
Clutch Lever Free Play	2 ~ 3 mm (0.08 ~ 0.12 in.)	— — —
Clutch		
Clutch Plate Assembly Length	30.3 ~ 30.9 mm (1.19 ~ 1.22 in.)	— — —
Friction Plate Thickness	2.65 ~ 2.95 mm (0.104 ~ 0.116 in.)	2.5 mm (0.10 in.)
Friction Plate Warp	0.15 mm (0.0059 in.) or less	0.3 mm (0.01 in.)
Steel Plate Warp:		
Without Knurling	0.15 mm (0.0059 in.) or less	0.3 mm (0.01 in.)
With Knurling	0.20 mm (0.0079 in.) or less	0.3 mm (0.01 in.)

Special Tool**Gear Holder:
57001-1602****Gear Holder:
57001-1904**

○The both gear holders can be used.

6-6 CLUTCH

Clutch Lever and Cable

Due to friction plate wear and clutch cable stretch over a long period of use, the clutch must be adjusted in accordance with the Periodic Maintenance Chart.



WARNING

The engine and exhaust system get extremely hot during normal operation and can cause serious burns. Never touch the engine or exhaust pipe during clutch adjustment.

Clutch Lever Free Play Inspection

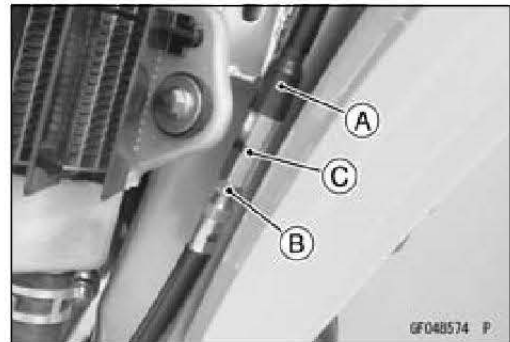
- Refer to the Clutch Operation Inspection (see Clutch Operation Inspection (2-33)).

Clutch Lever Free Play Adjustment

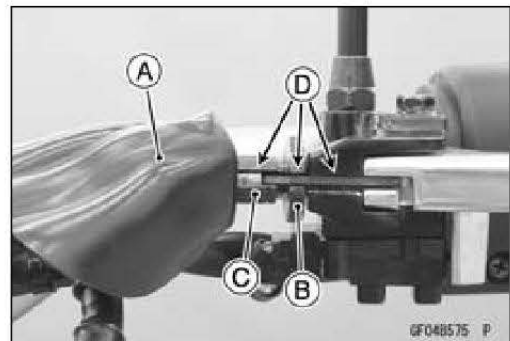
- Refer to the Clutch Operation Inspection (see Clutch Operation Inspection (2-33)).

Clutch Cable Removal

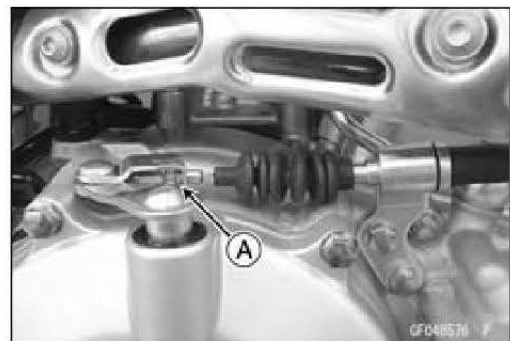
- Slide the dust cover [A].
- Loosen the locknut [B] and screw in the adjuster [C] fully.



- For KLX300D, slide the dust cover [A].
- Loosen the locknut [B].
- Screw in the adjuster [C].
- Line up the slots [D] in the clutch lever, locknut and adjuster, and then free the cable from the lever.



- Free the clutch inner cable tip [A] from the clutch release lever.
- Remove the clutch cable out of the frame.



Clutch Cable Installation

- Run the clutch cable correctly (see Cable, Wire, and Hose Routing section (17-2)).
- Adjust the clutch cable (see Clutch Operation Inspection (2-33)).
- Install the removed parts.

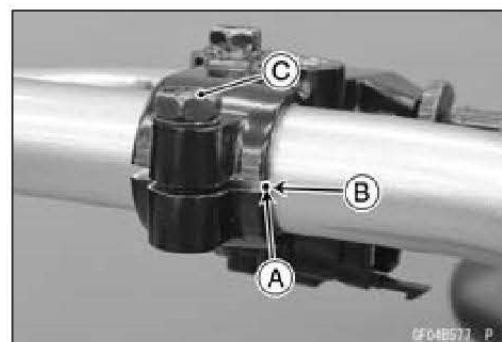
Clutch Lever and Cable

Clutch Cable Lubrication

- Refer to the Chassis Parts Lubrication (see Chassis Parts Lubrication (2-59)).

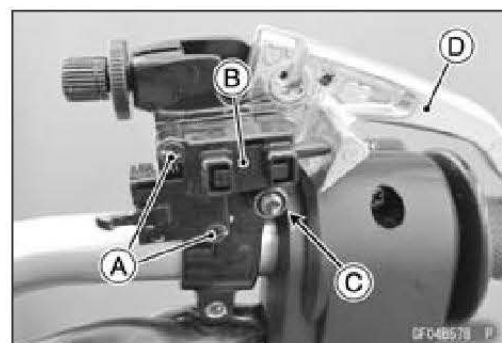
Clutch Lever Assembly Installation

- Install the clutch lever holder so that the slit [A] of the clutch lever clamp is aligned with the punch mark [B].
- Tighten the clutch lever holder clamp bolt [C] securely.



Clutch Lever Removal

- Remove the upper end of the clutch cable (see Clutch Cable Removal(6-6)).
- Disconnect the starter lockout switch connector.
- Loosen the clutch lever holder clamp bolt.
- Turn the clutch lever holder so that the clutch lever can be easily removed.
- Remove:
 - Starter Lockout Switch Screws [A]
 - Starter Lockout Switch [B]
 - Clutch Lever Pivot Locknut [C]
 - Clutch Lever Pivot Bolt
 - Clutch Lever [D]

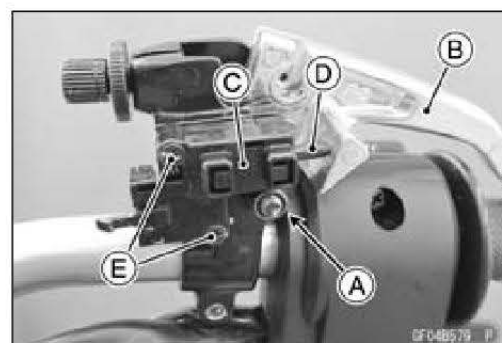


Clutch Lever Installation

WARNING

If the starter lockout switch pin has been damaged the starter lockout system will not work properly. This allows the motorcycle to be started in gear with the clutch lever released (clutch engaged), creating sudden forward movement that can result in an accident or injury. Check that the starter lockout switch operates properly when installing the clutch lever.

- Replace the clutch lever pivot locknut [A] with a new one.
- Install the clutch lever [B] and clutch lever pivot bolt.
- Tighten the clutch lever locknut securely.
- Install the starter lockout switch [C].
- Take care not to damage a pin [D] when installing the starter lockout switch.
- Tighten the starter lockout switch screws [E] securely.



6-8 CLUTCH

Clutch Lever and Cable

- Tighten the clutch lever holder clamp bolt ([see Clutch Lever Assembly Installation\(6-7\)](#))
- Install the upper end of the clutch cable ([see Clutch Cable Installation\(6-6\)](#)).
- Adjust the clutch cable ([see Clutch Operation Inspection \(2-33\)](#)).
- Check that the pin of the starter lockout switch moves smoothly.



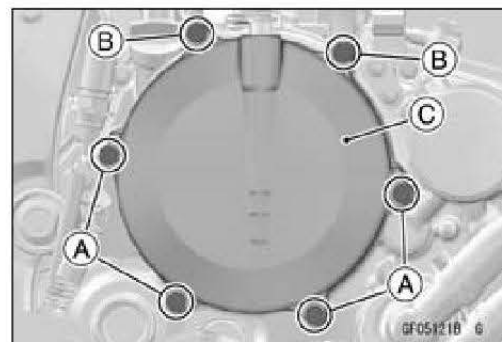
WARNING

Too much cable play can prevent clutch disengagement and cause an accident resulting in serious injury or death. When adjusting the clutch or replacing the cable, be sure the upper end of the clutch outer cable is fully seated in its fitting, or it could slip into place later, creating enough cable play to prevent clutch disengagement.

Clutch Cover and Right Engine Cover

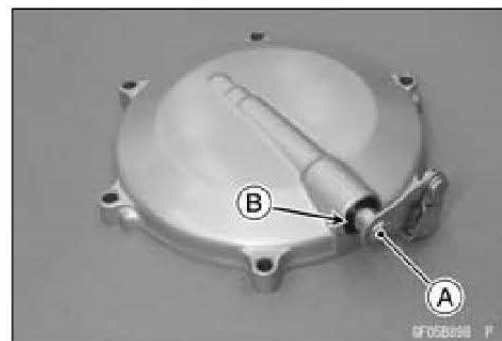
Clutch Cover Removal

- Drain the engine oil (see Engine Oil Change(2-34)).
- Remove:
 - Clutch Cable Lower End (see Clutch Cable Removal(6-6))
 - Clutch Cover Bolts [A] and Right Engine Cover Bolts [B]
 - Clutch Cover [C]
 - Gasket



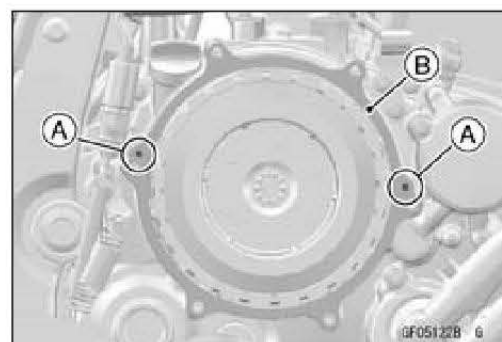
NOTICE

Do not remove the clutch release shaft [A] unless it is absolutely necessary. If removed, the oil seal [B] replacement may be required.



Clutch Cover Installation

- Be sure to install the dowel pins [A].
- Turn the clutch release lever toward the rear.
- Replace the clutch cover gasket [B] with a new one.



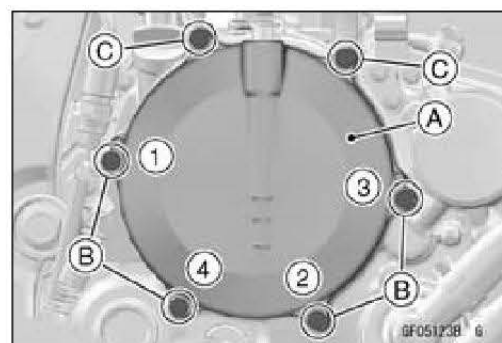
- Install the clutch cover [A].
- Tighten the clutch cover bolts following the specified tightening sequence [1 ~ 4].

Torque - Clutch Cover Bolts [B]: 9.8 N·m (1.0 kgf·m, 87 in·lb)

- Tighten:

Torque - Right Engine Cover Bolts (L = 70 mm) [C]: 9.8 N·m (1.0 kgf·m, 87 in·lb)

- Pour the engine oil (see Engine Oil Change(2-34)).
- Install the removed parts.



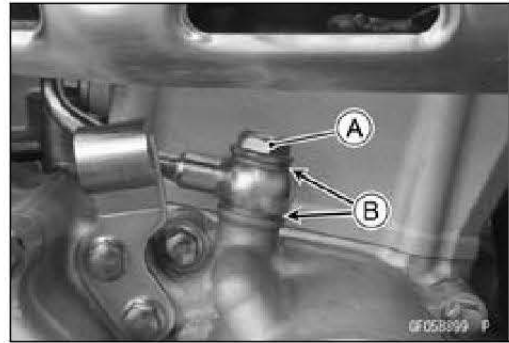
Right Engine Cover Removal

- Drain:
 - Engine Oil (see Engine Oil Change(2-34))
 - Coolant (see Coolant Change(2-25))

6-10 CLUTCH

Clutch Cover and Right Engine Cover

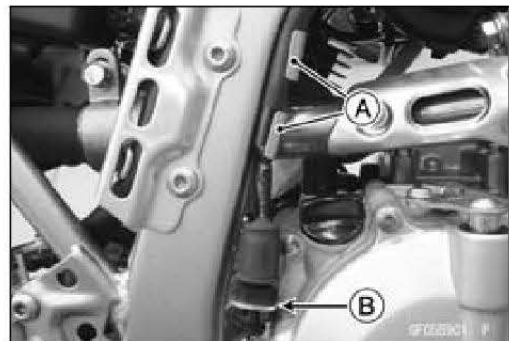
- Remove:
 - Clutch Cable Lower End (see [Clutch Cable Removal\(6-6\)](#))
 - Front Footpeg Bracket (see [Front Footpeg Removal\(15-17\)](#))
 - Brake Pedal (see [Brake Pedal Removal\(12-8\)](#))
 - Water Pump (see [Water Pump Removal\(4-11\)](#))
 - Oil Pipe Banjo Bolt [A] and Washers [B]



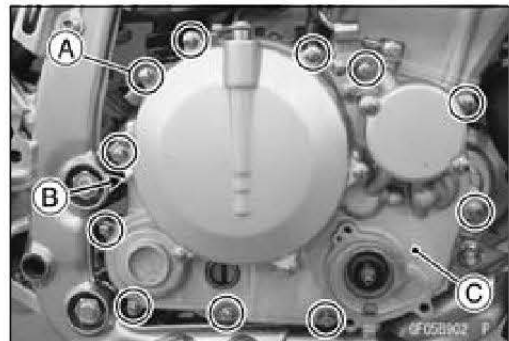
- Remove:
 - Rear Brake Light Switch Bracket Bolt [A]



- Free the rear brake light switch lead from the guides [A] with the bracket [B] installed.



- Remove:
 - Right Engine Cover Bolts [A]
 - Bracket [B] and Collar
 - Right Engine Cover [C]
 - Gasket



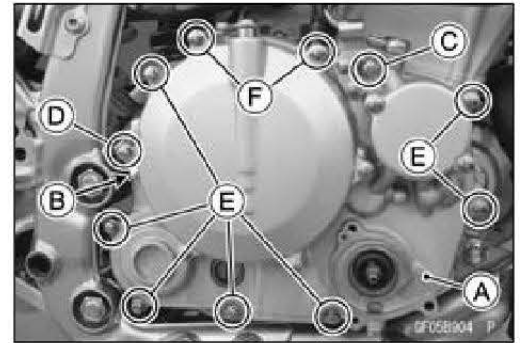
Right Engine Cover Installation

- Assemble the right engine cover (see [Right Engine Cover Assembly\(6-11\)](#)).
- Clean the clutch cover oil passages using compressed air.
- Be sure to install the dowel pins [A] and O-ring [B].
- Replace the right engine cover gasket [C] with a new one.



Clutch Cover and Right Engine Cover

- Install:
 - Right Engine Cover [A]
 - Collar and Bracket [B]
- Apply a non-permanent locking agent to the one of the right engine cover bolt [C].
- Install the right engine cover bolts.
 - L = 30 mm (1.2 in.) [D]
 - L = 25 mm (1.0 in.) [E]
 - L = 70 mm (2.8 in.) [F]



- Tighten the right engine cover bolts following the specified tightening sequence [1 ~ 13].

Torque - Right Engine Cover Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)

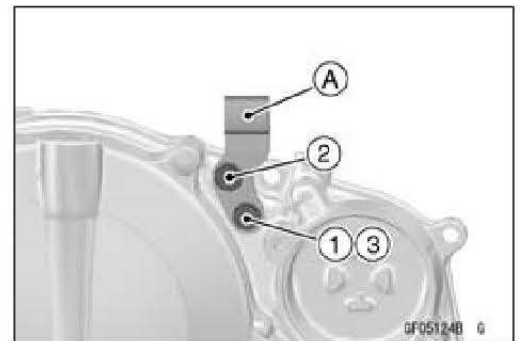


- Install the removed parts.
- Pour:
 - Engine Oil (see [Engine Oil Change\(2-34\)](#))
 - Coolant (see [Coolant Change\(2-25\)](#))
- Check the rear brake for good braking power and no brake drag.

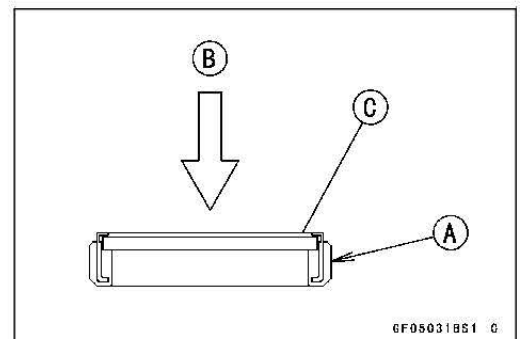
Right Engine Cover Assembly

- Install the clutch cable holder [A].
- Tighten the clutch cable holder bolts following the specified tightening sequence [1 ~ 3].

Torque - Clutch Cable Holder Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)



- Apply soap and water solution or rubber lubricant to the rubber portion of the oil level inspection window [A].
- Press [B] the oil level inspection window so that the glass surface [C] facing outward.
- Install:
 - Oil Pressure Relief Valve (see [Oil Pressure Relief Valve Installation\(7-10\)](#))
 - Mechanical Seal (see [Mechanical Seal Replacement\(4-12\)](#))

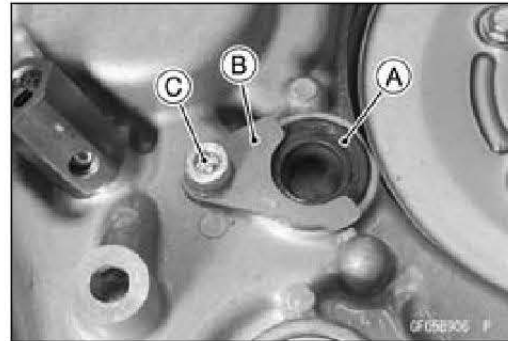


6-12 CLUTCH

Clutch Cover and Right Engine Cover

- Install the new oil seal [A] so that its end is flush with the right engine cover.
- Apply grease to the oil seal lip.
- Install the oil seal retaining plate [B].
- Apply a non-permanent locking agent to the oil seal retaining plate bolt [C].
- Tighten:

Torque - Oil Seal Retaining Plate Bolt: 12 N·m (1.2 kgf·m, 106 in·lb)



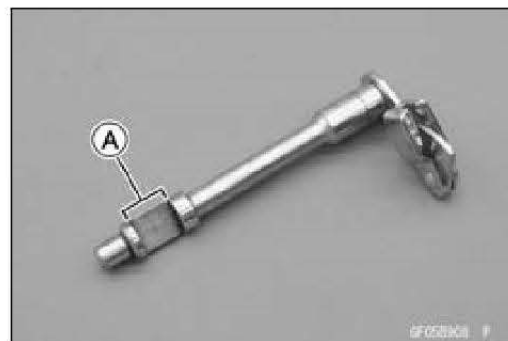
Release Shaft Removal

- Remove:
Clutch Cover (see Clutch Cover Removal(6-9))
- Pull the release lever and shaft assembly [A] straight out of the clutch cover.



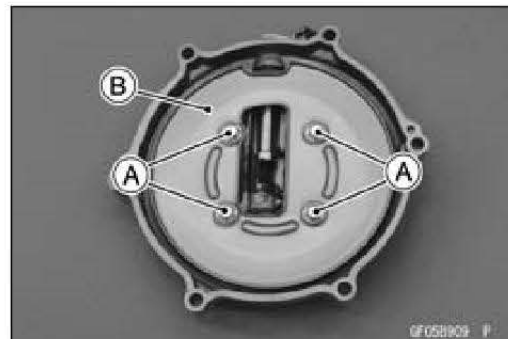
Release Shaft Installation

- Replace the oil seal with a new one.
- Apply grease to the oil seal lips on the upper ridge of the clutch cover.
- Apply engine oil to the needle bearings in the hole of the clutch cover.
- Apply molybdenum disulfide grease to the push rod holding portion [A] on the release shaft.
- Insert the release shaft straight into the upper hole of the clutch cover.
- Install the removed parts.



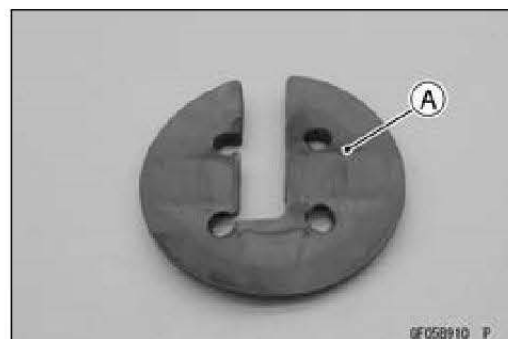
Clutch Cover Damper Removal

- Remove:
Clutch Cover (see Clutch Cover Removal(6-9))
Clutch Cover Damper Plate Bolts [A]
Clutch Cover Damper Plate [B]
Clutch Cover Damper



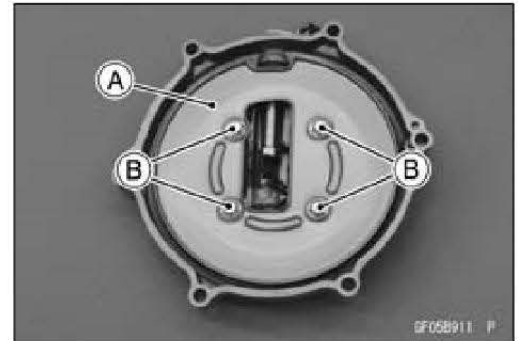
Clutch Cover Damper Installation

- Visually inspect the clutch cover damper [A].
- ★ If the clutch cover damper is damaged, replace it with a new one.



Clutch Cover and Right Engine Cover

- Install:
 - Clutch Cover Damper
 - Clutch Cover Damper Plate [A]
- Apply a non-permanent locking agent to the threads of the clutch cover damper plate bolts [B].
- Tighten:
Torque - Clutch Cover Damper Plate Bolts: 7.0 N·m (0.71 kgf·m, 62 in·lb)
- Install the clutch cover (see Clutch Cover Installation(6-9)).

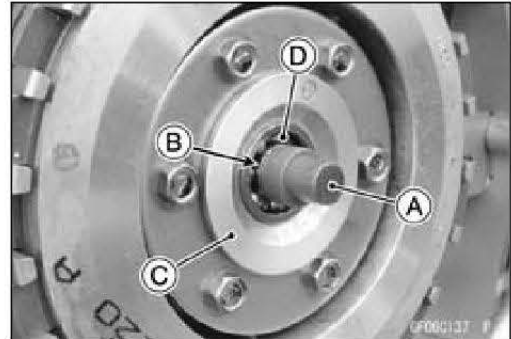


6-14 CLUTCH

Clutch

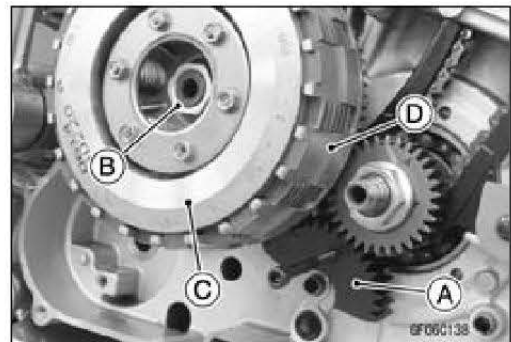
Clutch Removal

- Remove:
 - Right Engine Cover (see Right Engine Cover Removal(6-9))
 - Oil Pump (see Oil Pump Removal(7-11))
- Remove:
 - Clutch Pusher [A]
 - Washer [B]
 - Holder [C] and Ball Bearing [D]

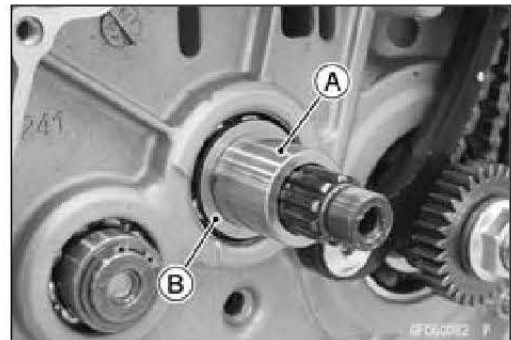


- Hold the clutch with the gear holder [A].
**Special Tool - Gear Holder: 57001-1602
or Gear Holder: 57001-1904**

- Remove:
 - Clutch Hub Nut [B] and Washer
 - Clutch Plate Assembly [C]
 - Washer
 - Clutch Housing [D]

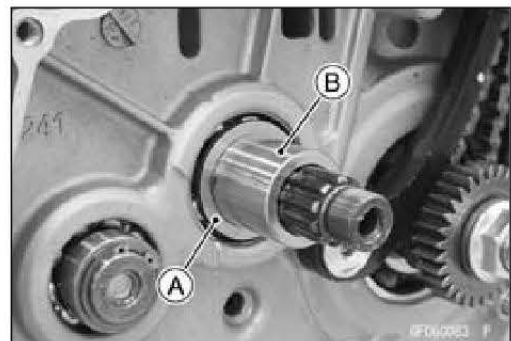


- Remove:
 - Sleeve [A]
 - Washer [B]



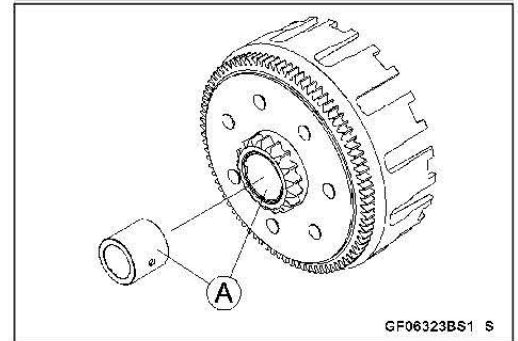
Clutch Installation

- Install:
 - Washer [A]
 - Sleeve [B]

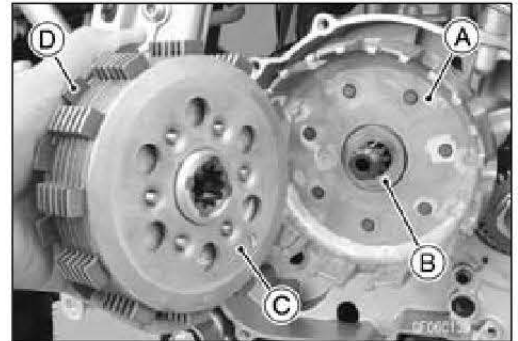


Clutch

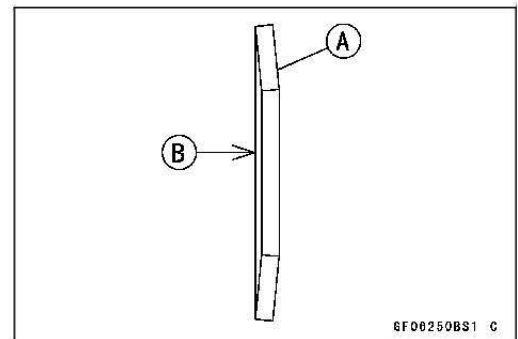
- Apply molybdenum disulfide grease [A] to the sleeve and inside of the clutch housing.



- Install:
Clutch Housing [A]
Washer [B]
- Install the clutch plate assembly [C].
- Install the last friction plate [D] in the shallower groove in the clutch housing.



- Replace the washer [A] with a new one.
- Install the washer with the concave side [B] inward.



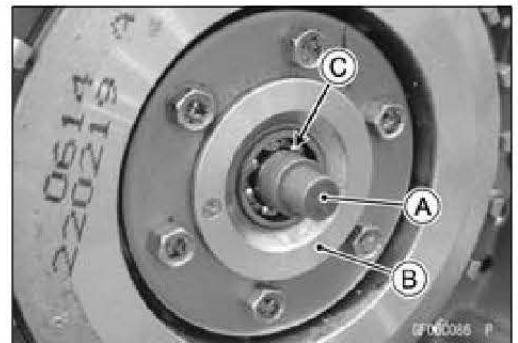
- Using the gear holder [A] to prevent the clutch from rotating.

**Special Tool - Gear Holder: 57001-1602
or Gear Holder: 57001-1904**

- Tighten:
Torque - Clutch Hub Nut [B]: 155 N·m (15.8 kgf·m, 114 ft·lb)



- Apply molybdenum disulfide grease to the clutch pusher [A].
- Install:
Holder [B]
Washer [C]
Clutch Pusher
- Install removed parts.



6-16 CLUTCH

Clutch

Clutch Plate Disassembly

- Remove:
 - Clutch Plate Assembly (see Clutch Removal(6-14))
 - Spring Bolts [A]
 - Spring Plate [B]
 - Springs [C]
 - Clutch Wheel [D]
 - Judder Spring Seat
 - Judder Spring
 - Friction Plates
 - Steel Plates

NOTE

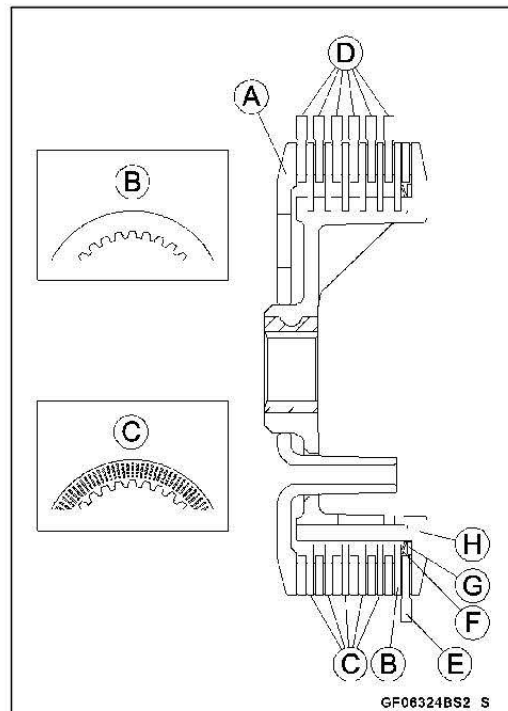
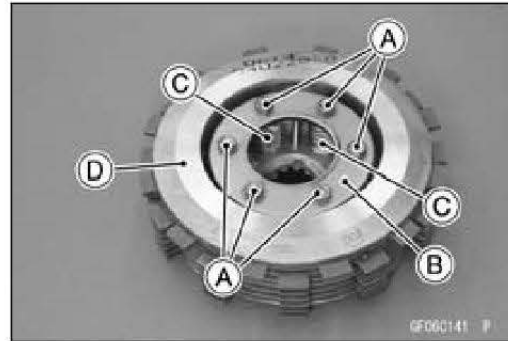
- There are 2 different steel plates installed in the clutch plate assembly.
- Mark and record the locations of the steel plates so that they can be reinstalled in their original positions.

Clutch Plate Assembly

- Assemble the following parts.
 - Clutch Wheel [A]
 - Steel Plate (with knurling) [B]
 - Steel Plates (without knurling) [C]
 - Friction Plates [D]
 - Last Friction Plate [E]
 - Judder Spring [F]
 - Judder Spring Seat [G]
 - Clutch Hub [H]

NOTICE

If new dry steel plates and friction plates are installed, apply engine oil to the surfaces of each plate to avoid clutch plate seizure.

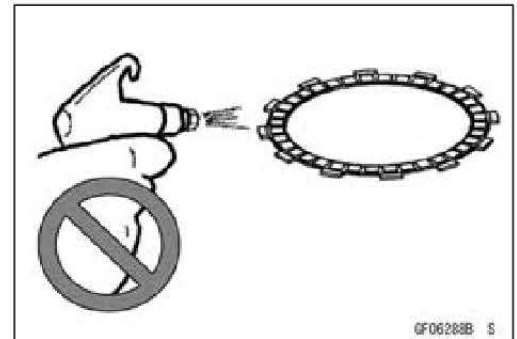
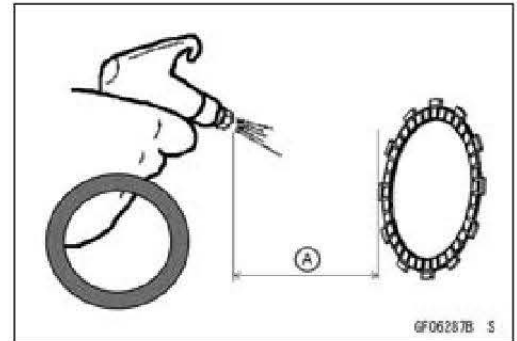


Clutch

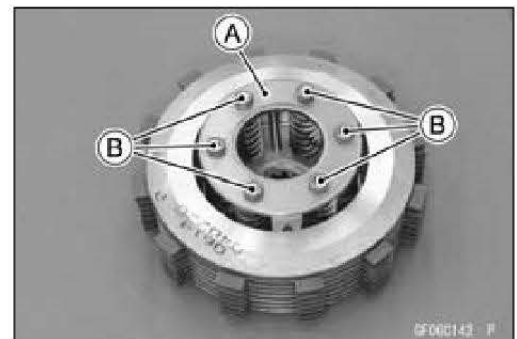
NOTICE

High pressure air blasts may detach clutch friction material from the friction plate. To prevent material detachment, set air pressure lower than 0.5 MPa (5 kgf/cm², 73 psi), do not place air nozzle closer than 30 cm (12 in.) to friction plate and only blow air at a right angle to the plate, facing the friction material. Do not blow air from the side (horizontally) of the plate since it is more likely to detach the friction material.

more than 30 cm (12 in.) [A]



- Install:
 - Clutch Springs
 - Clutch Spring Plate [A]
- Tighten the clutch spring bolts [B] by hand.



- Install the clutch plate assembly to the clutch housing.
- Install the last friction plate so that the tangs [A] fit into the grooves in the clutch housing as shown.
- Make sure that the clutch hub is installed without a gap.
- ★ If it has gap, reinstall the clutch plate assembly.
- Tighten the clutch spring bolts evenly with little by little to prevent tilting the clutch spring plate.

**NOTICE**

Do not tighten the one or two clutch spring bolt at once to prevent clutch spring plate warpage by the spring force.

- Tighten:
 - Torque - Clutch Spring Bolts: 5.0 N·m (0.51 kgf·m, 44 in·lb)
- Check the clutch plate assembly length (see Clutch Plate Assembly Inspection and Adjustment(6-18)).

6-18 CLUTCH

Clutch

Clutch Plate Assembly Inspection and Adjustment

- Measure the length [A] of the clutch plate assembly.

Clutch Plate Assembly Length

Standard: 30.3 ~ 30.9 mm (1.19 ~ 1.22 in.)

- ★ If the thickness is not in the standard range, change steel plates to adjust thickness.
- Remove:
 - Spring Bolt [B]
 - Spring Plate [C]
 - Springs [D]
 - Clutch Wheel [E]
- Replace the following steel plates [F].

Parts No.	Thickness
13089-1117	1.2 mm (0.05 in.)
13089-1094	1.6 mm (STD) (0.06 in.)
13089-1116	2.0 mm (0.08 in.)

NOTE

○ Do not use the steel plate of 1.2 mm (0.05 in.) and 2.0 mm (0.08 in.) thickness at the same time.

- Install the removed parts, and inspect the clutch plate assembly thickness.

Torque - Clutch Spring Bolts: 5.0 N·m (0.51 kgf·m, 44 in·lb)

Clutch Plate, Wear, Damage Inspection

- Visually inspect the friction and steel plates for signs of seizure, overheating (discoloration), or uneven wear.
- Measure the thickness of each friction plate [A] at several points.
- ★ If any plates show signs of damage, or if they have worn past the service limit, replace them with new ones.

Friction Plate Thickness

Standard: 2.65 ~ 2.95 mm (0.104 ~ 0.116 in.)

Service Limit: 2.5 mm (0.10 in.)

Clutch Plate Warp Inspection

- Place each friction plate or steel plate on a surface plate and measure the gap between the surface plate [A] and each friction plate or steel plate [B] with a thickness gauge [C]. The gap is the amount of friction or steel plate warp.
- ★ If any plate is warped over the service limit, replace it with a new one.

Friction and Steel Plate Warp

Standard:

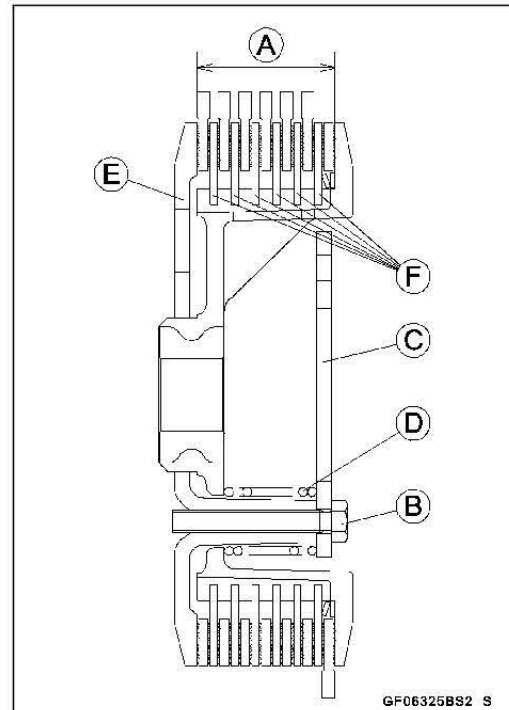
Friction Plate 0.15 mm (0.0059 in.) or less

Steel Plate

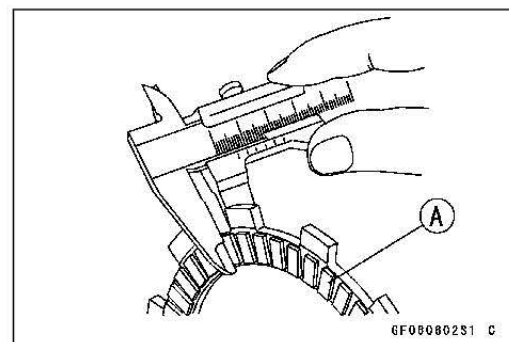
Without knurling 0.15 mm (0.0059 in.) or less

With knurling 0.20 mm (0.0079 in.) or less

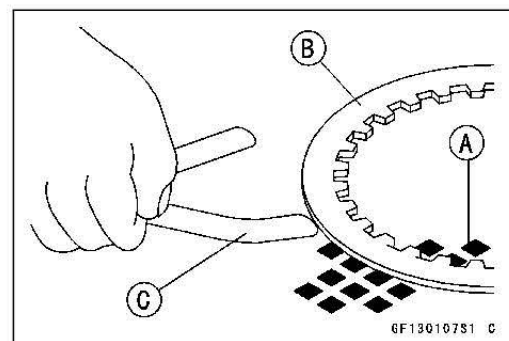
Service Limit: 0.3 mm (0.01 in.)



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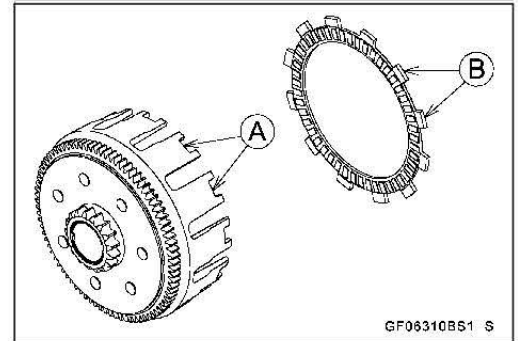


GF130107S1 C

Clutch

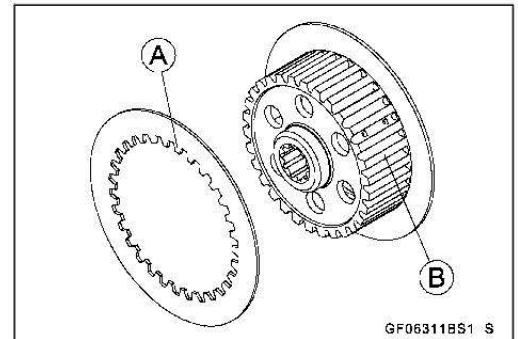
Clutch Housing Finger Inspection

- Visually inspect the clutch housing fingers [A] where the friction plate tangs [B] hit.
- ★ If they are badly worn or if there are groove cuts where the tangs hit, replace the housing. Also, replace the friction plates if their tangs are damaged.



Clutch Hub Spline Inspection

- Visually inspect the teeth [A] on the steel plates and the clutch hub splines [B] for wear.
- ★ If there are notches worn into the splines, replace the clutch hub. Also, replace the steel plates if their teeth are damaged.



Clutch Spring Inspection

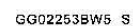
- ★ If all the components are good, but the problem still exists, replace the clutch springs.

Engine Lubrication System

Table of Contents

Exploded View.....	7-2
Engine Oil Flow Chart.....	7-4
Specifications	7-6
Special Tools	7-7
Engine Oil and Oil Filter.....	7-8
Oil Level Inspection.....	7-8
Engine Oil Change.....	7-8
Oil Filter Replacement	7-8
Oil Screen.....	7-9
Oil Screen Removal	7-9
Oil Screen Installation	7-9
Oil Screen Cleaning	7-9
Oil Pressure Relief Valve.....	7-10
Oil Pressure Relief Valve Removal.....	7-10
Oil Pressure Relief Valve Installation	7-10
Oil Pressure Relief Valve Inspection.....	7-10
Oil Pump.....	7-11
Oil Pump Removal	7-11
Oil Pump Installation	7-11
Oil Pump Disassembly.....	7-11
Oil Pump Assembly.....	7-12
Oil Pipe.....	7-13
Oil Pipe Removal	7-13
Oil Pipe Installation	7-13
Oil Return Hose Removal	7-13
Oil Return Hose Installation	7-13
Oil Pressure.....	7-14
Oil Pressure Measurement	7-14

Exploded View



ENGINE LUBRICATION SYSTEM 7-3

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Oil Pipe Banjo Bolt (M10)	20	2.0	15	
2	Oil Pipe Banjo Bolts (M8)	9.8	1.0	87 in·lb	
3	Engine Oil Drain Bolt	15	1.5	11	
4	Oil Filter Cap Bolts	9.8	1.0	87 in·lb	
5	Oil Pressure Relief Valve	15	1.5	11	L
6	Oil Seal Retaining Plate Bolt	12	1.2	106 in·lb	L
7	Oil Pump Mounting Screws (L = 30 mm)	5.2	0.53	46 in·lb	
8	Oil Pump Mounting Screw (L = 25 mm)	5.2	0.53	46 in·lb	
9	Oil Pump Cover Screws	10	1.0	89 in·lb	

EO: Apply engine oil.

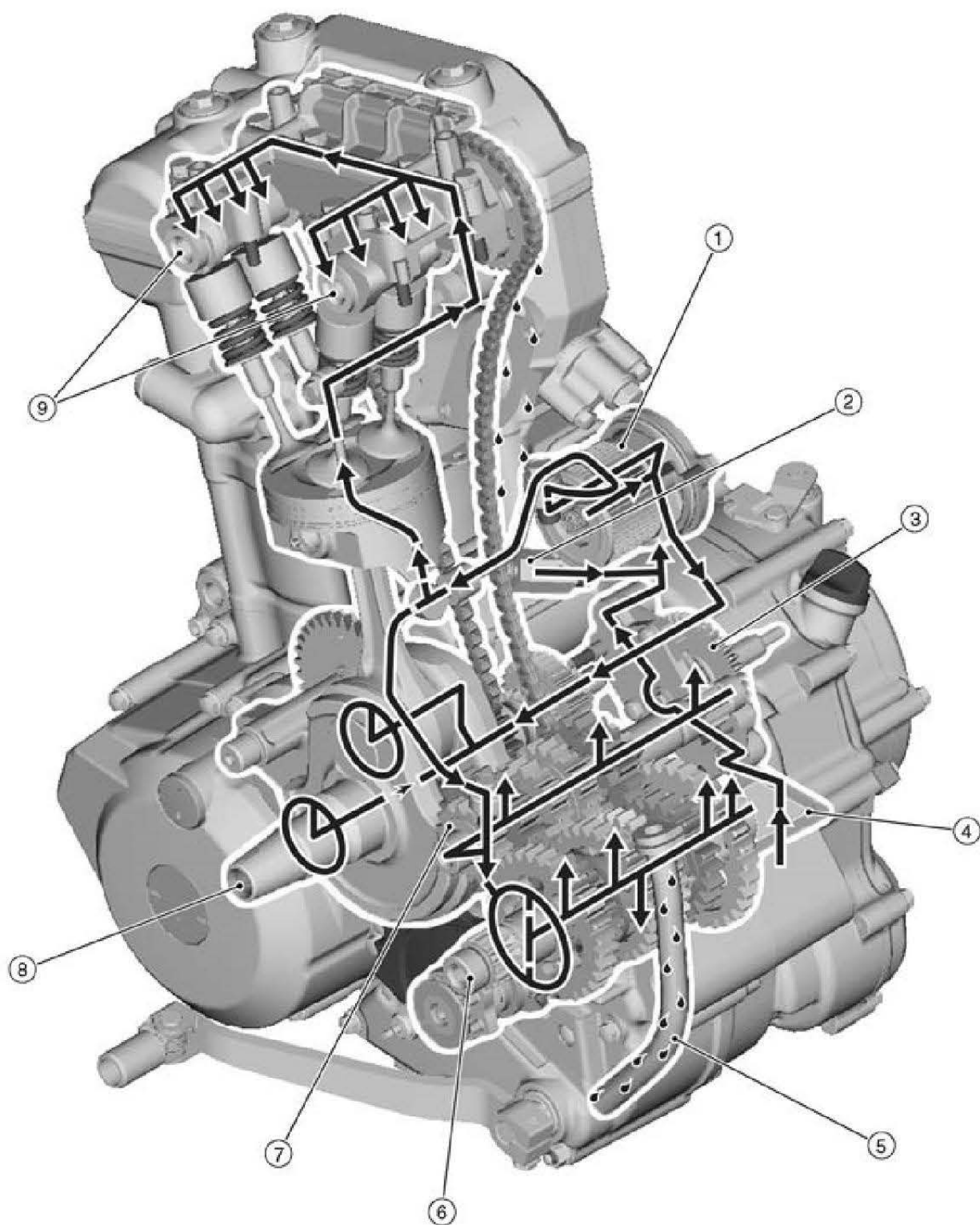
G: Apply grease.

L: Apply a non-permanent locking agent.

R: Replacement Parts

7-4 ENGINE LUBRICATION SYSTEM

Engine Oil Flow Chart



Engine Oil Flow Chart

1. Oil Filter
2. Oil Pressure Relief Valve
3. Oil Pump
4. Oil Screen
5. Oil Return Hose
6. Output Shaft
7. Drive Shaft
8. Crankshaft
9. Camshafts

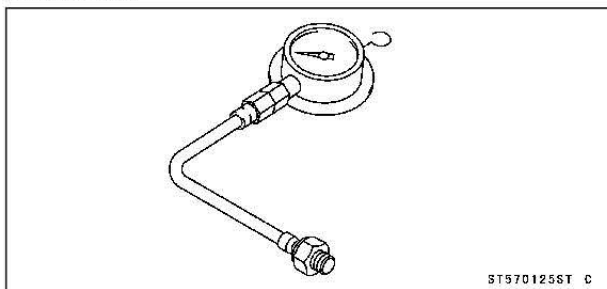
7-6 ENGINE LUBRICATION SYSTEM

Specifications

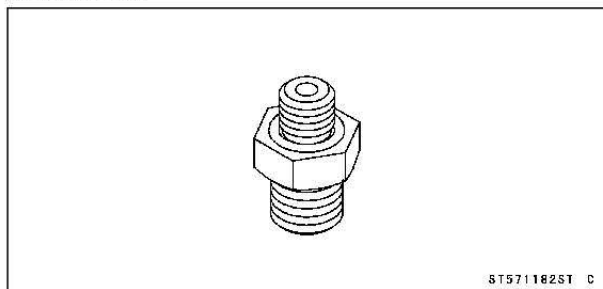
Item	Standard
Engine Oil	
Type	API SG, SH, SJ, SL or SM with JASO MA, MA1 or MA2
Viscosity	SAE 10W-40
Capacity	1.0 L (1.1 US qt) (when filter is not removed) 1.1 L (1.2 US qt) (when filter is removed) 1.3 L (1.4 US qt) (when engine is completely dry)
Level	Between upper and lower level lines (Wait several minutes after idling or running)
Oil Pressure Measurement	
Oil Pressure	59 ~ 147 kPa (0.60 ~ 1.50 kgf/cm ² , 8.6 ~ 21.3 psi) @4 000 r/min (rpm), Oil Temperature 90°C (194°F)

Special Tools

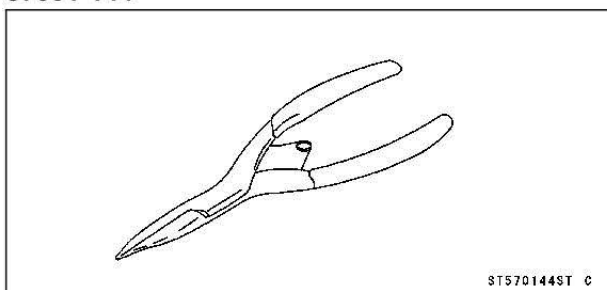
Oil Pressure Gauge, 5 kgf/cm²:
57001-125



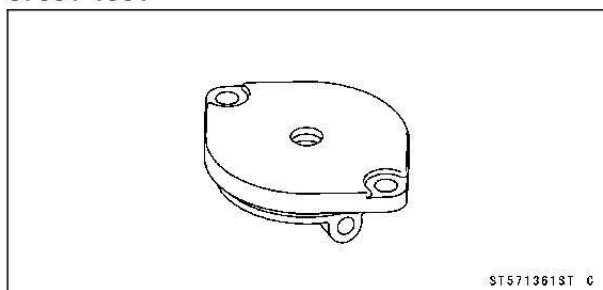
Oil Pressure Gauge Adapter, M10 × 1.25:
57001-1182



Outside Circlip Pliers:
57001-144



Oil Pressure Gauge Cap, M10 × 1.25:
57001-1361



7-8 ENGINE LUBRICATION SYSTEM

Engine Oil and Oil Filter

WARNING

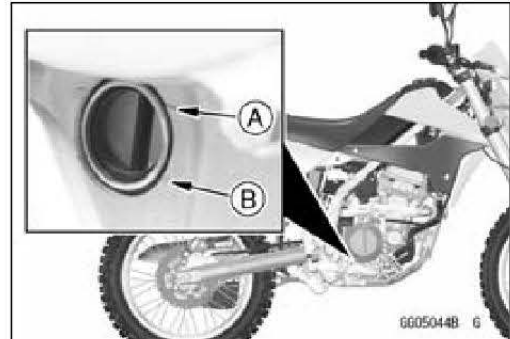
Vehicle operation with insufficient, deteriorated, or contaminated engine oil will cause accelerated wear and may result in engine seizure, accident, and injury. Check the oil level before each use and change the oil and filter according to the periodic maintenance chart.

Oil Level Inspection

- Check that the engine oil level is between the upper [A] and lower [B] levels in the oil level inspection window.

NOTE

- Situate the motorcycle so that it is perpendicular to the ground.
- If the motorcycle has just been used, wait several minutes for all the oil to drain down.
- If the oil has just been changed, start the engine and run it for several minutes at idle speed. This fills the oil filter with oil. Stop the engine, then wait several minutes until the oil settles.



NOTICE

Racing the engine before the oil reaches every part can cause engine seizure.

- ★ If the oil level is too high, remove the excess oil, using a syringe or some other suitable device.
- ★ If the oil level is too low, add the correct amount of oil through the oil filler opening. Use the same type and make of oil that is already in the engine.

NOTE

- If the engine oil type and make are unknown, use any brand of the specified oil to top off the level in preference to running the engine with the oil level low. Then at your earliest convenience, change the oil completely.

Engine Oil Change

- Refer to the Engine Oil Change (see Engine Oil Change(2-34)).

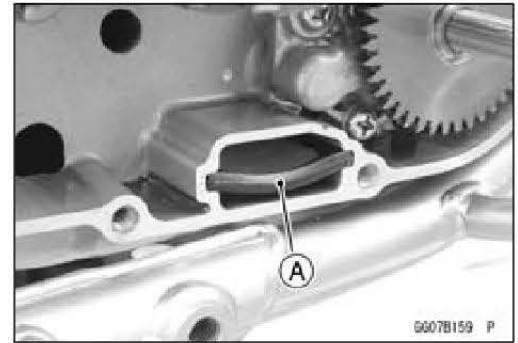
Oil Filter Replacement

- Refer to the Oil Filter Replacement (see Oil Filter Replacement(2-35)).

Oil Screen

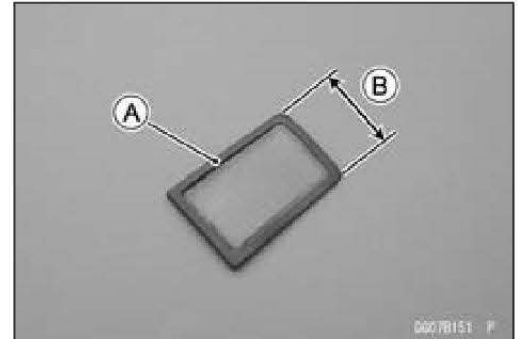
Oil Screen Removal

- Remove:
 - Right Engine Cover (see Right Engine Cover Removal(6-9))
 - Oil Screen [A]



Oil Screen Installation

- Clean the oil screen (see Oil Screen Cleaning(7-9)).
- Apply engine oil to the rim of the oil screen [A].
- Install the oil screen.
 - Place the narrow side [B] inward.
- Install the right engine cover (see Right Engine Cover Installation(6-10)).



Oil Screen Cleaning

- Remove the oil screen (see Oil Screen Removal(7-9)).
- Clean the oil screen with a high flash-point solvent and remove the particles stuck.
- Blow away the particles by applying compressed air from the clean side to the dirty side.

WARNING

Gasoline and low flash-point solvents can be flammable and/or explosive and cause severe burns. Clean the screen in a well-ventilated area, and take care that there are no sparks or flame anywhere near the working area; this includes any appliance with a pilot light. Do not use gasoline or a low flash-point solvent to clean the screen.

NOTE

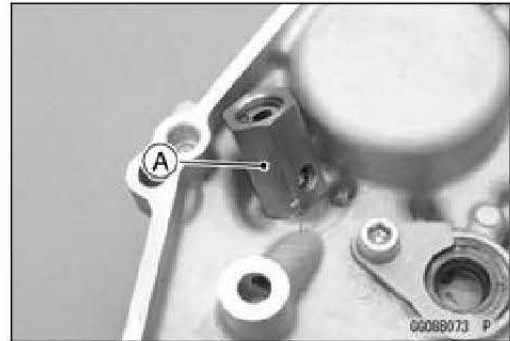
- While cleaning the screen, check for any metal particles that might indicate internal engine damage.
- Check the screens carefully for any damage.
- ★ If the screen is damaged, replace the oil screen with a new one.
- Install the oil screen (see Oil Screen Installation(7-9)).

7-10 ENGINE LUBRICATION SYSTEM

Oil Pressure Relief Valve

Oil Pressure Relief Valve Removal

- Remove:
 - Right Engine Cover (see Right Engine Cover Removal(6-9))
 - Oil Pressure Relief Valve [A]



Oil Pressure Relief Valve Installation

- Apply a non-permanent locking agent to the threads of the oil pressure relief valve.

NOTICE

Do not apply too much non-permanent locking agent to the threads. This may block the oil passage.

- Tighten:
 - Torque - Oil Pressure Relief Valve: 15 N·m (1.5 kgf·m, 11 ft·lb)
- Install the right engine cover (see Right Engine Cover Installation(6-10)).

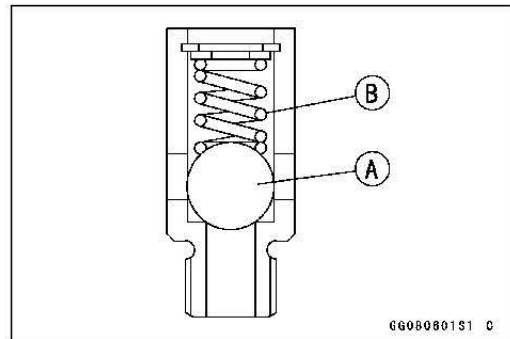
Oil Pressure Relief Valve Inspection

- Remove the oil pressure relief valve (see Oil Pressure Relief Valve Removal(7-10)).
- Check to see if the ball [A] slides smoothly when pushing it in with a wooden or other soft rod, and see if it comes back to its seat by spring [B] pressure.

NOTE

○Inspect the oil pressure relief valve in its assembled state. Disassembly and assembly may change the performance.

- ★If any rough spots are found during above inspection, wash the valve clean with a high flash-point solvent and blow out any foreign particles that may be in the valve with compressed air.



⚠ WARNING

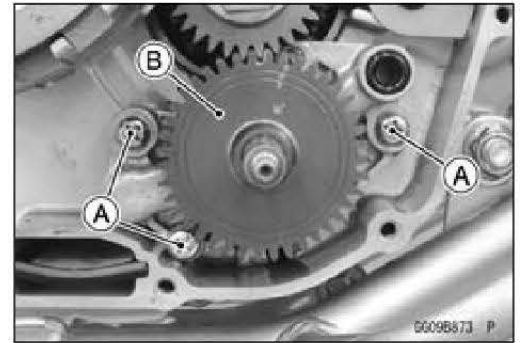
Gasoline and low flash-point solvents can be flammable and/or explosive and cause severe burns. Clean the oil pressure relief valve in a well-ventilated area, and take care that there are no sparks or flame anywhere near the working area; this includes any appliance with a pilot light. Do not use gasoline or a low flash-point solvent to clean the oil pressure relief valve.

- ★If cleaning does not solve the problem, replace the oil pressure relief valve as an assembly. The oil pressure relief valve is precision made with no allowance for replacement of individual parts.
- Install the oil pressure relief valve (see Oil Pressure Relief Valve Installation(7-10)).

Oil Pump

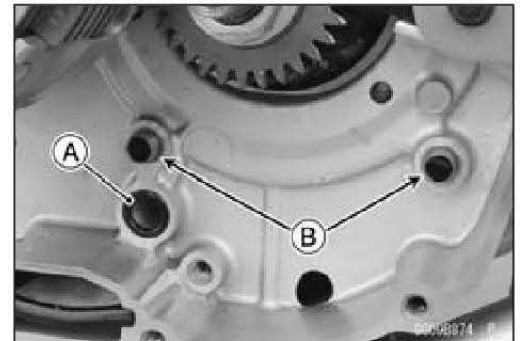
Oil Pump Removal

- Remove:
 - Right Engine Cover (see Right Engine Cover Removal(6-9))
 - Oil Pump Mounting Screws [A]
 - Oil Pump [B]

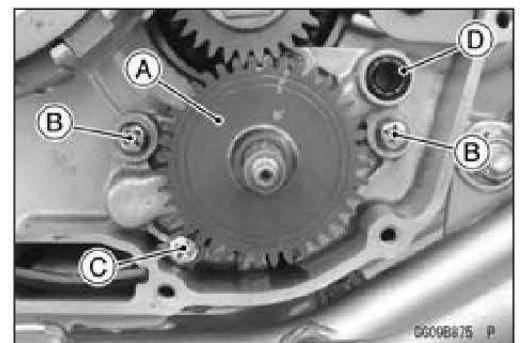


Oil Pump Installation

- Replace the O-ring [A] with a new one.
- Apply grease to the O-ring, and install it.
- Be sure to install the dowel pins [B].

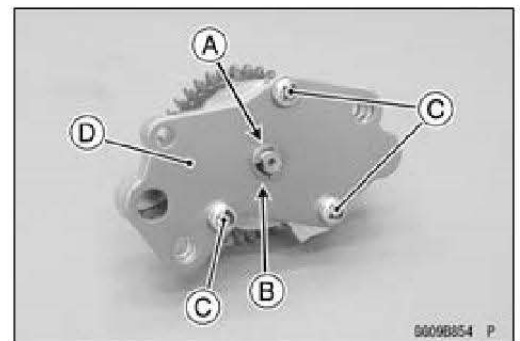


- Install the oil pump [A].
- Tighten:
 - Torque - Oil Pump Mounting Screws (L = 30 mm) [B]: 5.2 N·m (0.53 kgf·m, 46 in·lb)**
 - Oil Pump Mounting Screw (L = 25 mm) [C]: 5.2 N·m (0.53 kgf·m, 46 in·lb)**
- Replace the O-ring [D] with a new one.
- To prevent falling, apply grease to the O-ring.
- Install the O-ring so that the chamfer side faces outward.
- Install the right engine cover (see Right Engine Cover Installation(6-10)).



Oil Pump Disassembly

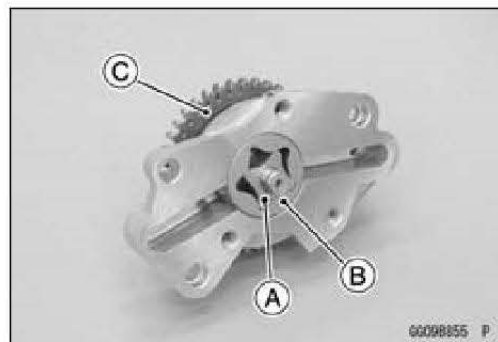
- Remove:
 - Oil Pump (see Oil Pump Removal(7-11))
 - Circlip [A]
 - Washer [B]
 - Oil Pump Cover Screws [C]
 - Oil Pump Cover [D]
- Special Tool - Outside Circlip Pliers: 57001-144**



7-12 ENGINE LUBRICATION SYSTEM

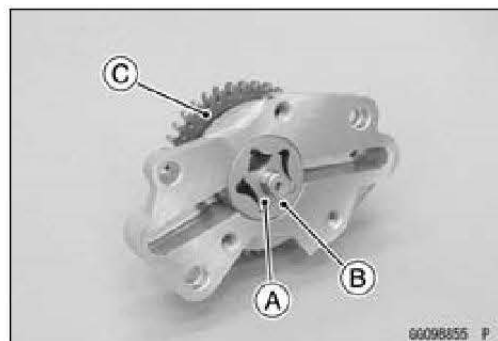
Oil Pump

- Remove:
 - Inner Rotor [A]
 - Outer Rotor [B]
 - Oil Pump Gear [C]



Oil Pump Assembly

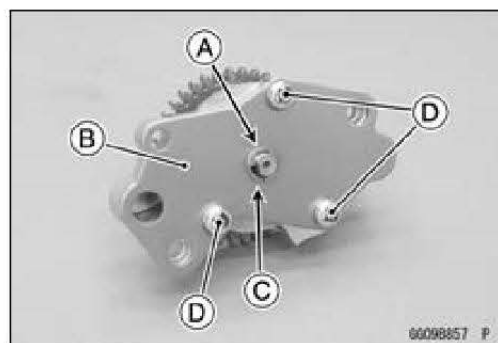
- Apply engine oil to the inner rotor [A] and outer rotor [B].
- Install the rotors and the oil pump gear [C].



- Replace the circlip [A] with a new one.
- Install:
 - Oil Pump Cover [B]
 - Washer [C]
 - Circlip

Special Tool - Outside Circlip Pliers: 57001-144

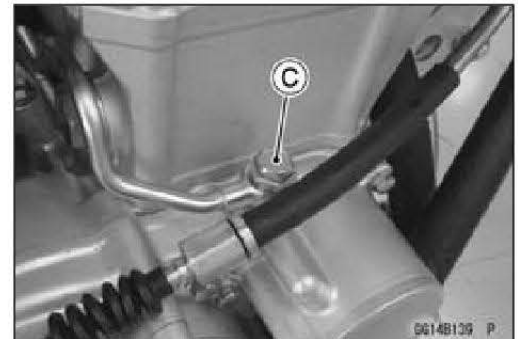
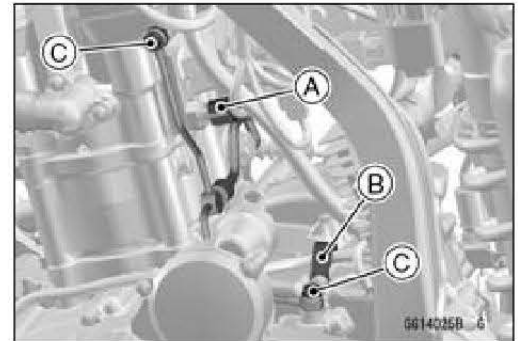
- Tighten:
 - Torque - Oil Pump Cover Screws [D] : 10 N·m (1.0 kgf·m, 89 in·lb)**



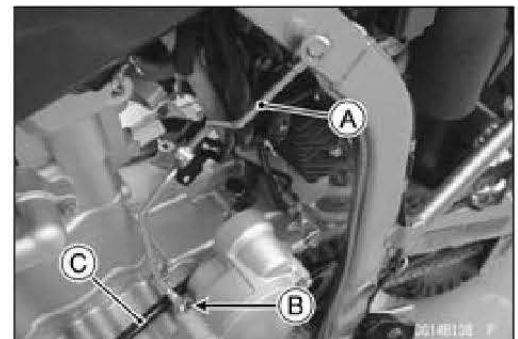
Oil Pipe

Oil Pipe Removal

- Remove:
 - Exhaust Pipe (see Exhaust Pipe Removal(5-43))
 - Starter Motor (see Starter Motor Removal(16-44))
- Disconnect the water temperature sensor connector [A].
- Open the clamp [B].
- Remove:
 - Oil Pipe Banjo Bolts [C] and Washers

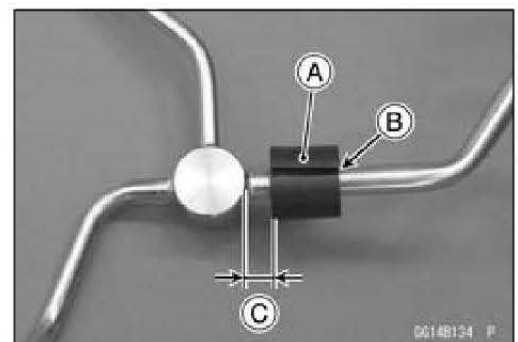


- Turn the oil pipe [A] to clear the rear side fitting [B] from the alternator lead [C].



Oil Pipe Installation

- Replace the washers of the oil pipe with new ones.
- Install the damper [A] so that its slit [B] faces in back of the vehicle.
 - About 5 mm (0.2 in.) [C]
- Tighten:
 - Torque - Oil Pipe Banjo Bolts (M8): 9.8 N·m (1.0 kgf·m, 87 in·lb)
 - Oil Pipe Banjo Bolt (M10): 20 N·m (2.0 kgf·m, 15 ft·lb)



Oil Return Hose Removal

- Refer to the Crankcase Splitting (see Crankcase Splitting(9-8)).

Oil Return Hose Installation

- Refer to the Crankcase Assembly (see Crankcase Assembly(9-9)).

7-14 ENGINE LUBRICATION SYSTEM

Oil Pressure

Oil Pressure Measurement

- Remove the oil filter cap (see Oil Filter Replacement(2-35)).
- Install the O-ring [A] to the oil pressure cap [B].

Special Tools - Oil Pressure Gauge, 5 kgf/cm² [C]: 57001-125

Oil Pressure Gauge Adapter, M10 × 1.25 [D]: 57001-1182

Oil Pressure Gauge Cap, M10 × 1.25: 57001-1361

- Install the oil pressure cap [A] using the oil filter cap bolts [B].
- Start the engine and warm up the engine.
- Run the engine at the specified speed, and read the oil pressure gauge.

Oil Pressure

Standard: 59 ~ 147 kPa (0.60 ~ 1.50 kgf/cm², 8.6 ~ 21.3 psi) @4 000 r/min (rpm), Oil Temperature 90 °C (194 °F)

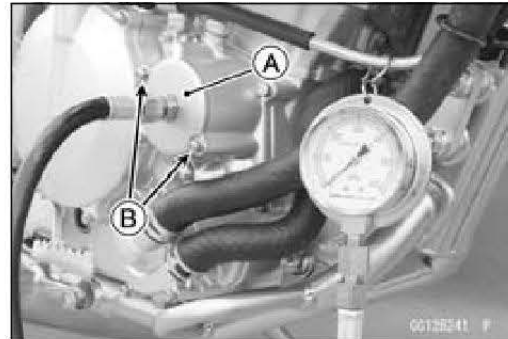
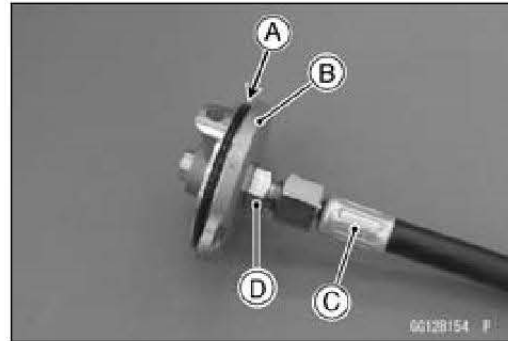
- ★ If the reading is less than the specified value, inspect the oil pump and relief valve.
- ★ If the oil pump and relief valve are not at fault, inspect the rest of the lubrication system.
- Stop the engine, remove the oil pressure cap.



WARNING

Hot oil can cause severe burns. Beware of hot engine oil that will drain through the oil filter when the plug is removed.

- Install the oil filter cap (see Oil Filter Replacement(2-35)).



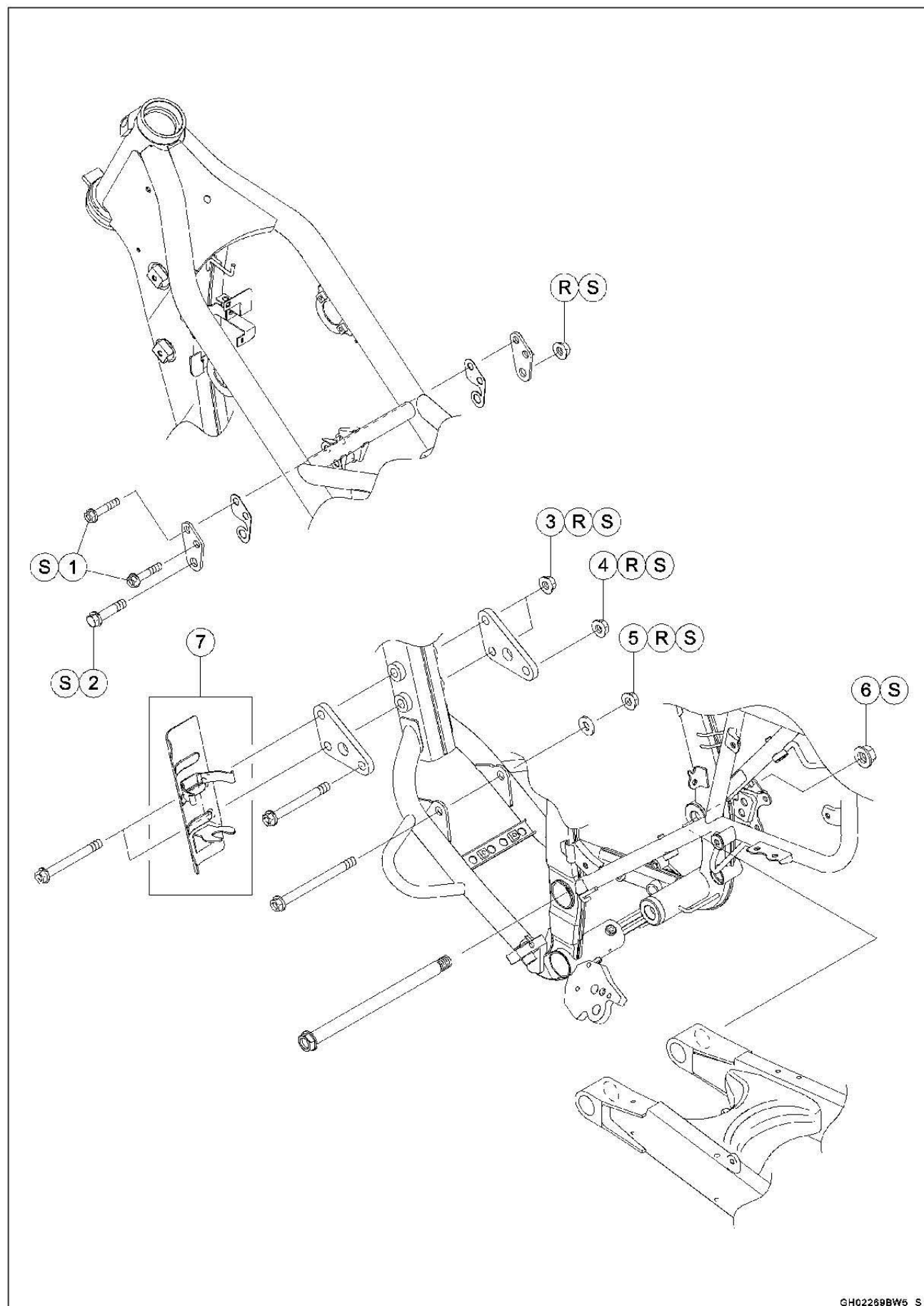
Engine Removal/Installation

Table of Contents

Exploded View.....	8-2
Special Tool	8-4
Engine Removal/Installation	8-5
Engine Removal.....	8-5
Engine Installation.....	8-8

8-2 ENGINE REMOVAL/INSTALLATION

Exploded View



ENGINE REMOVAL/INSTALLATION 8-3

Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Upper Engine Bracket Bolts	23	2.3	17	S
2	Upper Engine Mounting Bolt	50	5.1	37	S
3	Middle Engine Bracket Nuts	50	5.1	37	R, S
4	Middle Engine Mounting Nut	50	5.1	37	R, S
5	Lower Engine Mounting Nut	50	5.1	37	R, S
6	Swingarm Pivot Shaft Nut	88	9.0	65	S

7. CAL Model

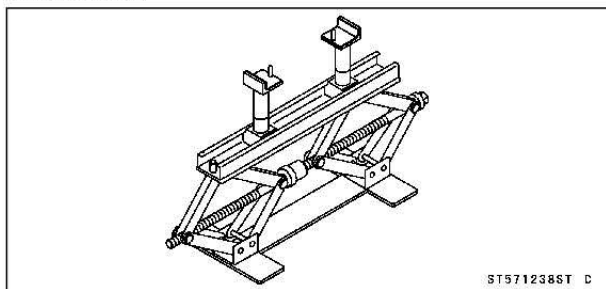
R: Replacement Parts

S: Follow the specified tightening sequence.

8-4 ENGINE REMOVAL/INSTALLATION

Special Tool

Jack:
57001-1238



Engine Removal/Installation

Engine Removal

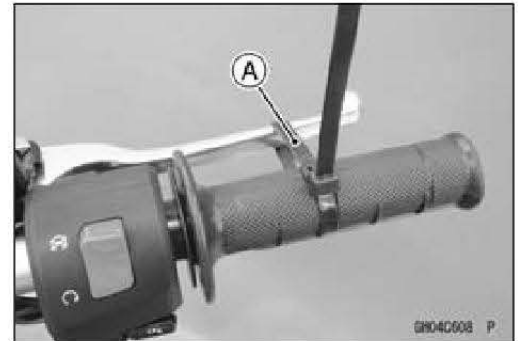
- Place a jack under the frame to support the motorcycle.
Special Tool - Jack: 57001-1238
- Squeeze the brake lever slowly and hold it with a band [A].

WARNING

Motorcycle may fall over unexpectedly resulting in an accident or injury. Be sure to hold the front brake when removing the engine.

NOTICE

Be sure to hold the front brake when removing the engine, or the motorcycle may fall over. The engine or the motorcycle could be damaged.

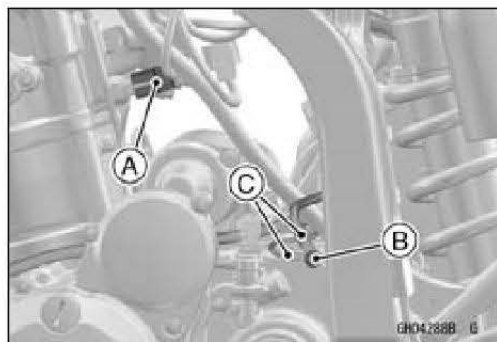


- Drain:
 - Engine Oil ([see Engine Oil Change\(2-34\)\)](#))
 - Coolant ([see Coolant Change\(2-25\)\)](#))
- Remove:
 - Fuel Tank ([see Fuel Tank Removal\(3-113\)\)](#))
 - Regulator/Rectifier ([see Regulator/Rectifier Removal\(16-32\)\)](#))
 - Engine Sprocket ([see Engine Sprocket Removal\(11-10\)\)](#))
 - Shift Pedal ([see Shift Pedal Removal\(9-21\)\)](#))
 - Air Switching Valve ([see Air Switching Valve Removal\(5-13\)\)](#))
 - Spark Plug Cap ([see Spark Plug Cleaning and Inspection\(16-40\)\)](#))
 - Throttle Body Assy ([see Throttle Body Assy Removal\(3-108\)\)](#))
 - Radiator ([see Radiator Removal\(4-15\)\)](#))
 - Exhaust Pipe ([see Exhaust Pipe Removal\(5-43\)\)](#))
 - Clutch Cable Lower End ([see Clutch Cable Removal\(6-6\)\)](#))
 - Front Footpeg Bracket ([see Front Footpeg Removal\(15-17\)\)](#))
 - Brake Pedal ([see Brake Pedal Removal\(12-8\)\)](#))
 - Rear Brake Light Switch Bracket ([see Right Engine Cover Removal\(6-9\)\)](#))
 - Canister (CAL Model) ([see Evaporative Emission Control System Inspection \(CAL Model\)\(2-24\)\)](#))
 - Separator (CAL Model) ([see Evaporative Emission Control System Inspection \(CAL Model\)\(2-24\)\)](#))

8-6 ENGINE REMOVAL/INSTALLATION

Engine Removal/Installation

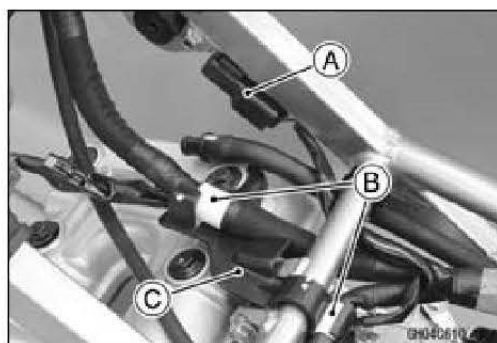
- Disconnect the water temperature sensor connector [A].
- Remove the engine ground terminal bolt [B] to disconnect the engine ground terminals [C].



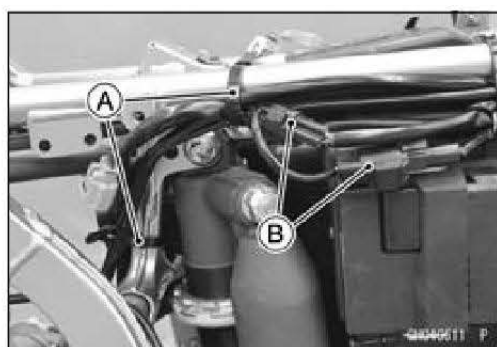
- Remove the bolts [A] to free the vehicle-down sensor with the bracket.



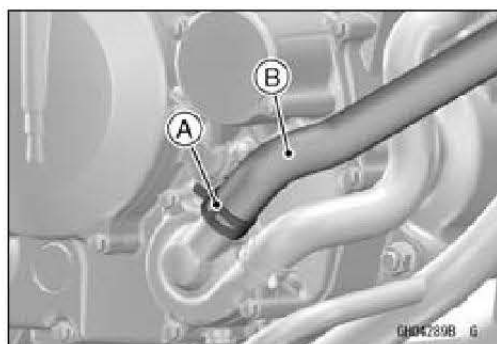
- Remove the fuel pump relay [A] from the frame.
- Clear the main harness [B] from the holder, and remove the main harness holder [C].



- Remove the bands [A].
- Disconnect the connectors [B].

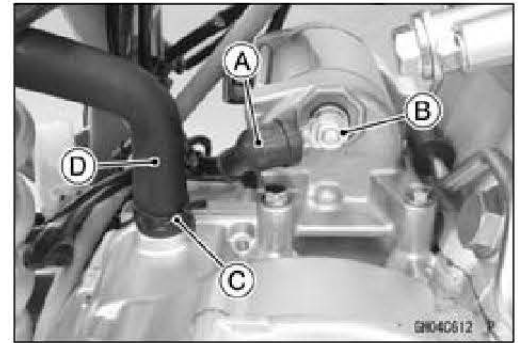


- Slide the clamp [A].
- Disconnect the water hose [B].

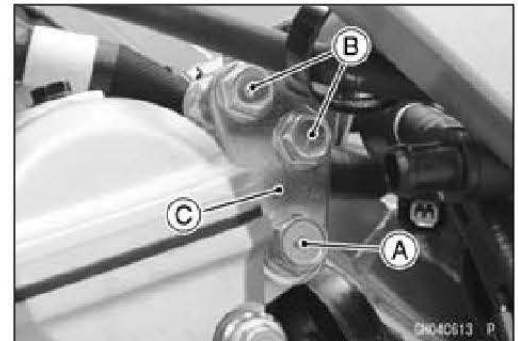


Engine Removal/Installation

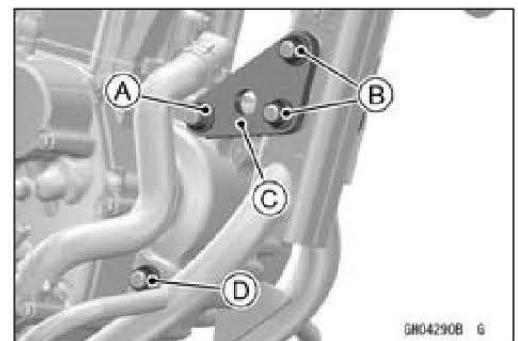
- Slide the rubber cap [A], and remove the starter motor cable terminal nut [B].
- Slide the clamp [C], and disconnect the breather hose [D].



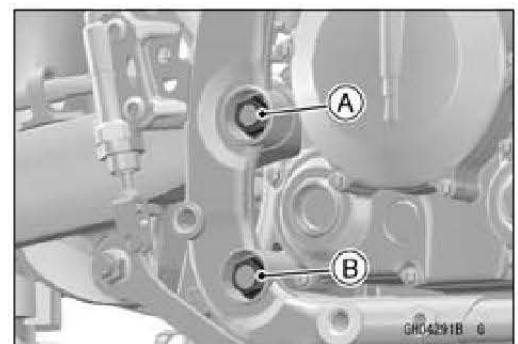
- Remove:
Upper Engine Mounting Bolt [A] and Nut
Upper Engine Bracket Bolts [B]
Upper Engine Brackets [C] and Plates



- Remove:
Front Engine Mounting Bolt and Nut [A]
Front Engine Bracket Bolts and Nuts [B]
Front Engine Brackets [C]
Lower Engine Mounting Bolt and Nut [D]



- Remove the swingarm pivot shaft nut [A], and pull out the swingarm pivot shaft.
- Loosen the rocker arm pivot shaft nut [B], if the swingarm pivot shaft does not pull out.
- Lift the engine a little and lean it to the right.
- Take out the engine to the right.



8-8 ENGINE REMOVAL/INSTALLATION

Engine Removal/Installation

Engine Installation

- Support the engine with a commercially available stand and place it into the frame in reverse order of removal.
- Hang the drive chain to the output shaft.
- Insert the swingarm pivot shaft from the left side, and put the engine in its original position.
- Replace:
 - Lower Engine Mounting Nut
 - Middle Engine Bracket Nuts
 - Middle Engine Mounting Nut
 - Upper Engine Mounting Nut
- Tighten the bolts and nuts following the specified tightening sequence [1 ~ 8] as shown.

Torque - Swingarm Pivot Shaft Nut [1]: 88 N·m (9.0 kgf·m, 65 ft·lb)

Lower Engine Mounting Nut [2]: 50 N·m (5.1 kgf·m, 37 ft·lb)

Middle Engine Mounting Nut [3]: 50 N·m (5.1 kgf·m, 37 ft·lb)

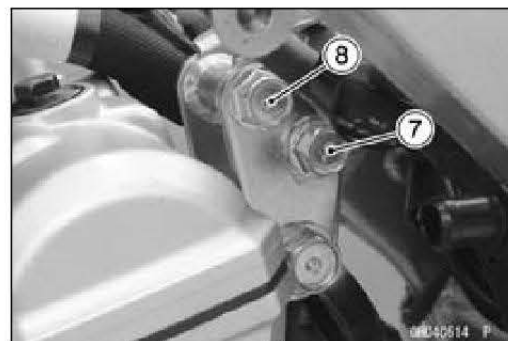
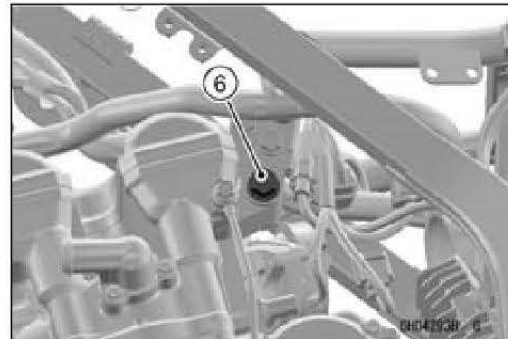
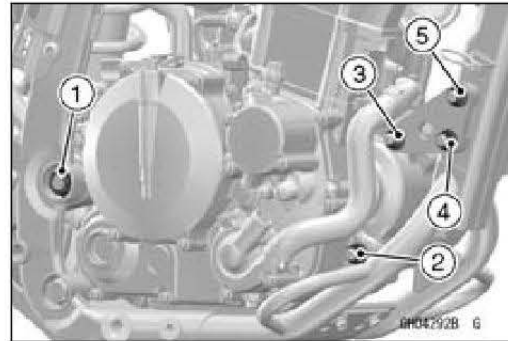
Middle Engine Bracket Nuts [4] [5]: 50 N·m (5.1 kgf·m, 37 ft·lb)

Upper Engine Mounting Bolt [6]: 50 N·m (5.1 kgf·m, 37 ft·lb)

Upper Engine Bracket Bolts [7] [8]: 23 N·m (2.3 kgf·m, 17 ft·lb)

○Tighten the rocker arm nut, if loosen it.

Torque - Rocker Arm Nut: 98 N·m (10 kgf·m, 72 ft·lb)



- Run the leads, cables and hoses correctly (see Cable, Wire, and Hose Routing(17-2)).
- Install the removed parts.
- Adjust:
 - Throttle Cables (see Throttle Control System Inspection(2-18))
 - Clutch Cable (see Clutch Operation Inspection (2-33))
 - Drive Chain (see Drive Chain Slack Adjustment(2-39))
- Fill the engine with engine oil (see Engine Oil Change(2-34)).
- Fill the engine with coolant (see Coolant Change(2-25)).

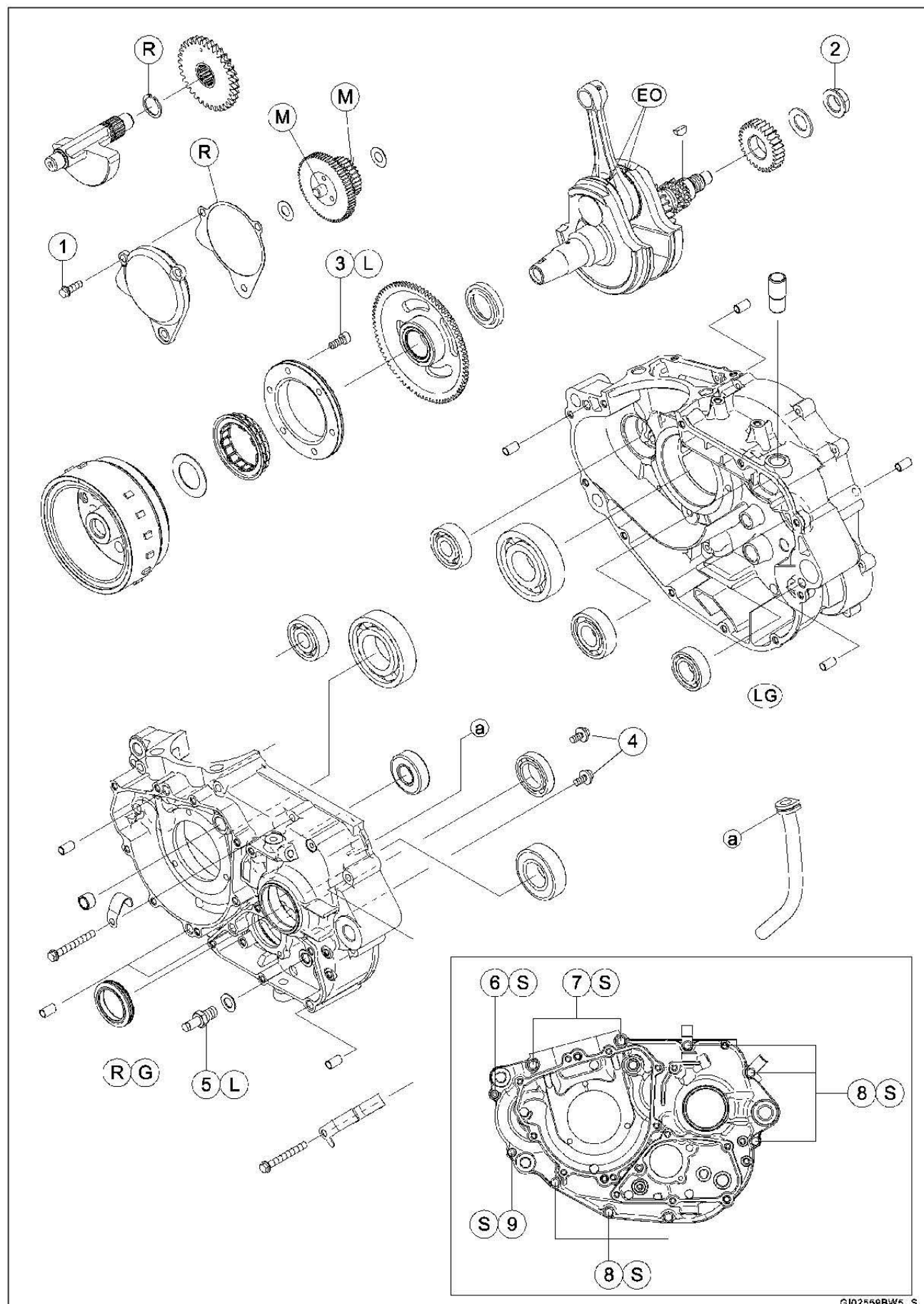
Crankshaft/Transmission

Table of Contents

Exploded View.....	9-2	Torque Limiter Inspection.....	9-19
Specifications	9-6	Primary Gear	9-20
Special Tools and Sealant	9-7	Primary Gear Removal	9-20
Crankcase Splitting.....	9-8	Primary Gear Installation	9-20
Crankcase Splitting	9-8	External Shift Mechanism.....	9-21
Crankcase Assembly	9-9	Shift Pedal Removal	9-21
Crankshaft/Connecting Rod	9-14	Shift Pedal Installation	9-21
Crankshaft Removal	9-14	External Shift Mechanism	
Crankshaft Installation	9-14	Removal.....	9-21
Crankshaft/Connecting Rod		External Shift Mechanism	
Cleaning	9-14	Installation	9-22
Connecting Rod Bend Inspection	9-15	External Shift Mechanism	
Connecting Rod Twist Inspection.	9-15	Inspection.....	9-25
Connecting Rod Big End Radial		Transmission	9-26
Clearance Inspection	9-15	Transmission Removal	9-26
Connecting Rod Big End Side		Transmission Installation	9-26
Clearance Inspection	9-15	Transmission Disassembly	9-27
Crankshaft Runout Inspection.....	9-16	Transmission Assembly	9-27
Crankshaft Alignment.....	9-16	Shift Fork Bending Inspection	9-32
Balancer	9-17	Shift Fork/Gear Groove Wear	
Balancer Removal.....	9-17	Inspection.....	9-32
Balancer Installation.....	9-17	Shift Fork Guide Pin/Drum	
Balancer Disassembly	9-17	Groove Wear Inspection	9-32
Balancer Assembly	9-17	Gear Dog and Gear Dog Hole	
Starter Motor Clutch	9-18	Damage Inspection	9-32
Starter Motor Clutch Removal.....	9-18	Ball Bearing, Needle Bearing, and Oil	
Starter Motor Clutch Installation...	9-18	Seal.....	9-33
Starter Motor Clutch Inspection ...	9-18	Ball and Needle Bearing Wear	
Torque Limiter.....	9-19	Inspection.....	9-33
Torque Limiter Removal	9-19	Oil Seal Inspection	9-33
Torque Limiter Installation	9-19		

9-2 CRANKSHAFT/TRANSMISSION

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Torque Limiter Cover Bolts	9.8	1.0	87 in·lb	
2	Primary Gear Nut	98	10	72	
3	Starter Motor Clutch Bolts	12	1.2	106 in·lb	L
4	Shift Drum Bearing Retaining Bolts	9.8	1.0	87 in·lb	
5	Shift Shaft Return Spring Pin	37	3.8	27	L
6	Crankcase Allen Bolt (L = 35 mm)	15	1.5	11	S
7	Crankcase Bolts (L = 70 mm)	9.8	1.0	87 in·lb	S
8	Crankcase Bolts (L = 50 mm)	9.8	1.0	87 in·lb	S
9	Crankcase Allen Bolt (L = 50 mm)	15	1.5	11	S

EO: Apply engine oil.

G: Apply grease.

L: Apply a non-permanent locking agent.

LG: Apply liquid gasket.

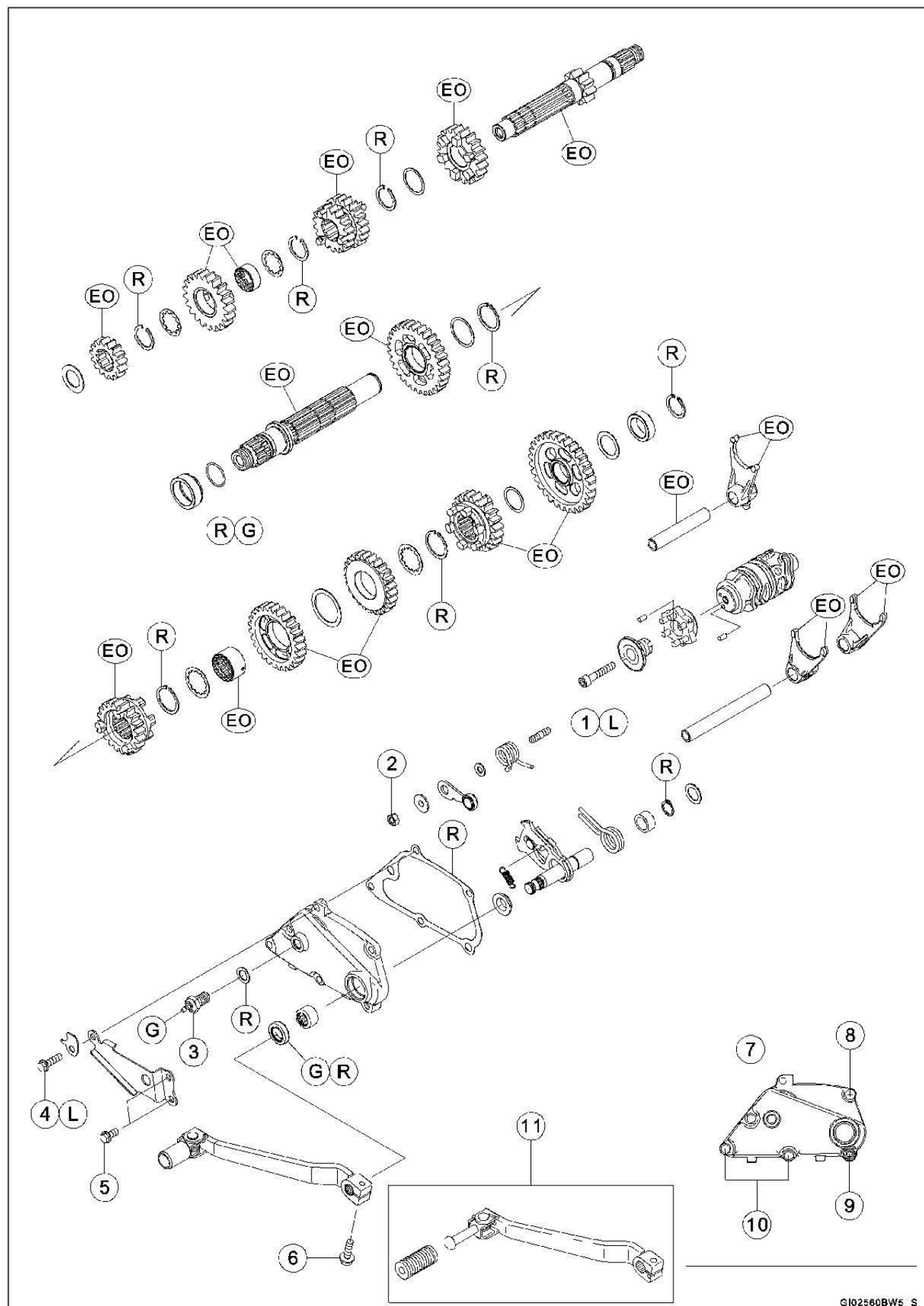
M: Apply molybdenum disulfide grease.

R: Replacement Parts

S: Follow the specified tightening sequence.

9-4 CRANKSHAFT/TRANSMISSION

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Shift Drum Cam Holder Bolt	12	1.2	106 in·lb	L
2	Gear Positioning Lever Nut	9.8	1.0	87 in·lb	
3	Neutral Switch	15	1.5	11	G
4	Cover/Guard Plate Bolt	9.8	1.0	87 in·lb	L
5	Drive Chain Guard Plate Bolts	9.8	1.0	87 in·lb	
6	Shift Pedal Bolt	12	1.2	106 in·lb	
7	External Shift Mechanism Cover Bolt (L = 30 mm)	9.8	1.0	87 in·lb	
8	External Shift Mechanism Cover Screw	5.2	0.53	46 in·lb	
9	External Shift Mechanism Cover Nut	9.8	1.0	87 in·lb	
10	External Shift Mechanism Cover Bolts (L = 20 mm)	9.8	1.0	87 in·lb	

11. KLX300E

EO: Apply engine oil.

G: Apply grease.

L: Apply a non-permanent locking agent.

R: Replacement Parts

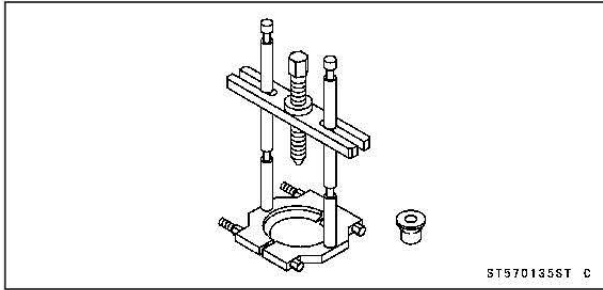
9-6 CRANKSHAFT/TRANSMISSION

Specifications

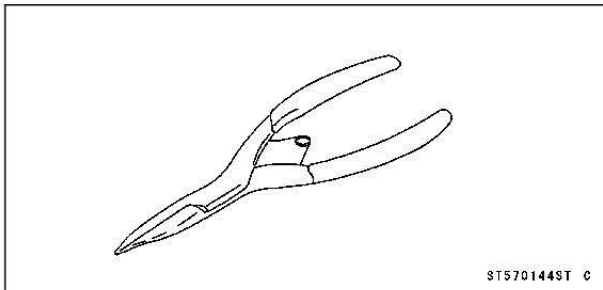
Item	Standard	Service Limit
Crankshaft/Connecting Rod		
Connecting Rod Bend	— — —	TIR 0.2/100mm (0.008/3.94 in.)
Connecting Rod Twist	— — —	TIR 0.2/100mm (0.008/3.94 in.)
Connecting Rod Big End:		
Radial Clearance	0.008 ~ 0.020 mm (0.0003 ~ 0.0008 in.)	0.07 mm (0.003 in.)
Side Clearance	0.25 ~ 0.35 mm (0.0098 ~ 0.0138 in.)	0.6 mm (0.02 in.)
Crankshaft Runout	TIR 0.03 mm (0.0012 in.) or less	TIR 0.08 mm (0.0031 in.)
Transmission		
Shift Fork Ear Thickness	4.9 ~ 5.0 mm (0.19 ~ 0.20 in.)	4.8 mm (0.19 in.)
Shifter Groove Width	5.05 ~ 5.15 mm (0.199 ~ 0.203 in.)	5.3 mm (0.21 in.)
Shift Fork Guide Pin Diameter	5.9 ~ 6.0 mm (0.23 ~ 0.24 in.)	5.8 mm (0.23 in.)
Shift Drum Groove Width	6.05 ~ 6.20 mm (0.238 ~ 0.244 in.)	6.3 mm (0.25 in.)

Special Tools and Sealant

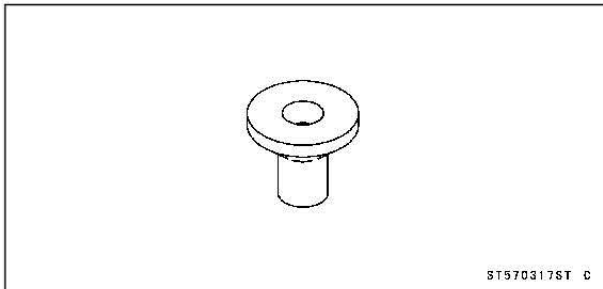
Bearing Puller:
57001-135



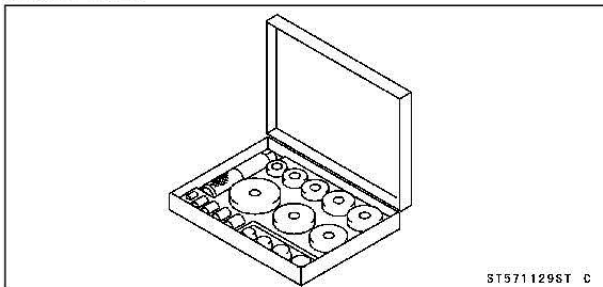
Outside Circlip Pliers:
57001-144



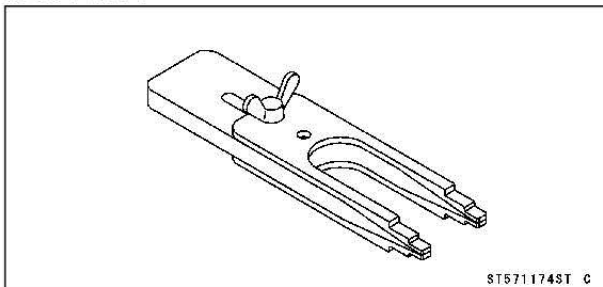
Bearing Puller Adapter:
57001-317



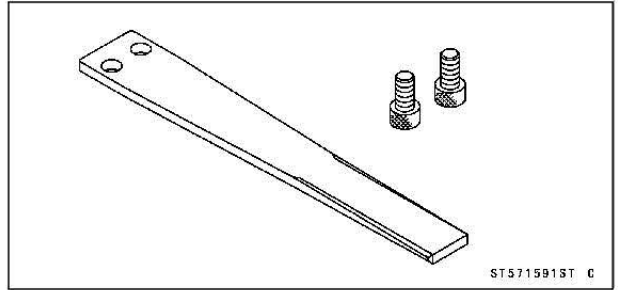
Bearing Driver Set:
57001-1129



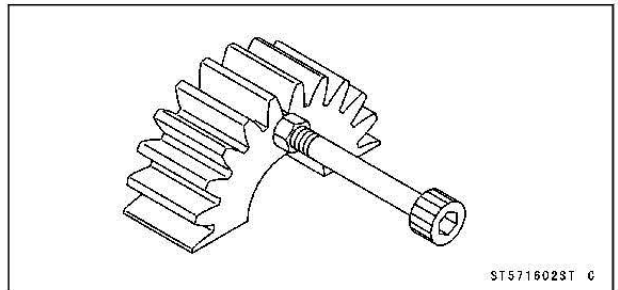
Crankshaft Jig:
57001-1174



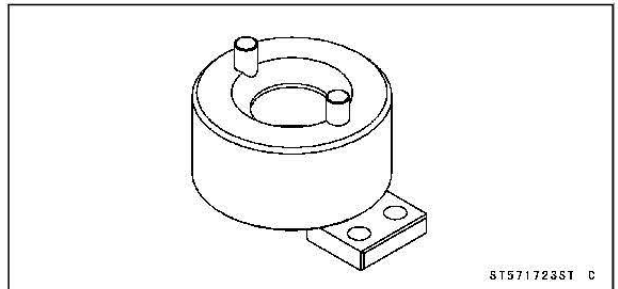
Grip:
57001-1591



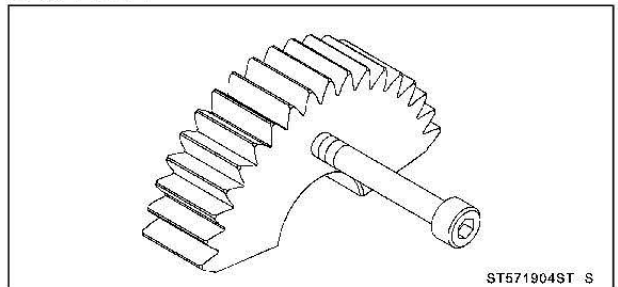
Gear Holder:
57001-1602



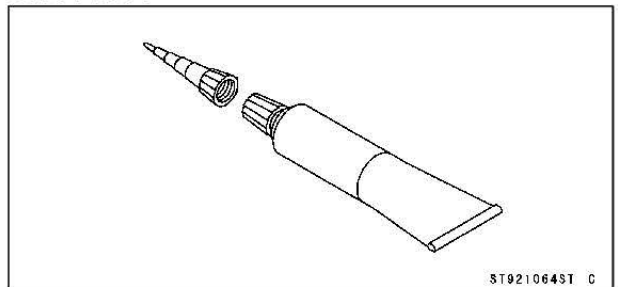
Rotor Holder:
57001-1723



Gear Holder:
57001-1904



Liquid Gasket, TB1216B:
92104-1064



○The both gear holders can be used.

9-8 CRANKSHAFT/TRANSMISSION

Crankcase Splitting

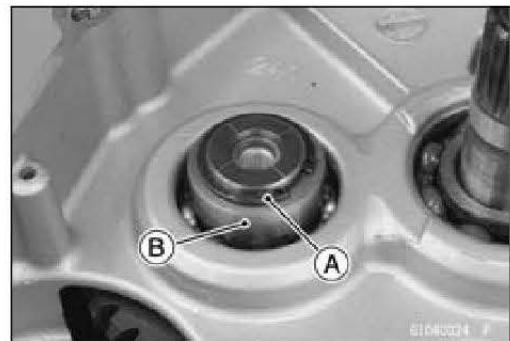
Crankcase Splitting

- Remove the engine (see [Engine Removal\(8-5\)](#)).
- Set the engine on a clean surface and hold it steady.
- Remove:
 - Alternator Rotor and Starter Motor Idle Gear (see [Alternator Rotor Removal\(16-27\)](#))
 - Starter Motor (see [Starter Motor Removal\(16-44\)](#))
 - Oil Pipe (see [Oil Pipe Removal\(7-13\)](#))
 - Cylinder (see [Cylinder Removal\(5-37\)](#))
 - Piston (see [Piston Removal\(5-38\)](#))
 - Primary Gear (see [Primary Gear Removal\(9-20\)](#))
 - Clutch (see [Clutch Removal\(6-14\)](#))
 - Oil Pump (see [Oil Pump Removal\(7-11\)](#))
 - Oil Screen (see [Oil Screen Removal\(7-9\)](#))
 - Camshaft Chain (see [Camshaft Chain Removal\(5-21\)](#))
 - Shift Shaft Assembly (see [External Shift Mechanism Removal\(9-21\)](#))
- Remove the collar [A] and O-ring from the output shaft.

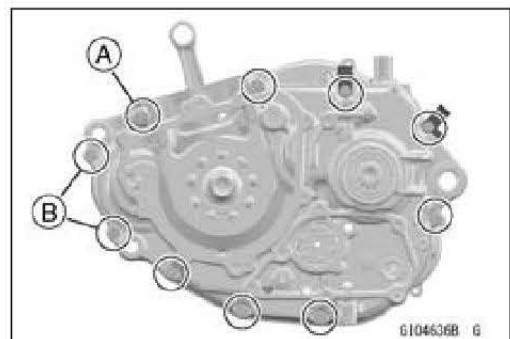


- Remove the circlip [A], and remove the collar [B] from the output shaft.

Special Tool - Outside Circlip Pliers: 57001-144

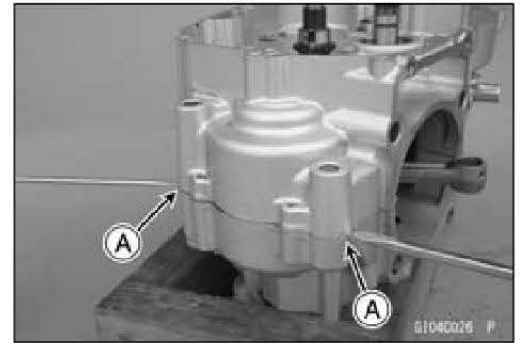


- Remove:
 - Crankcase Bolts [A]
 - Crankcase Allen Bolts [B]

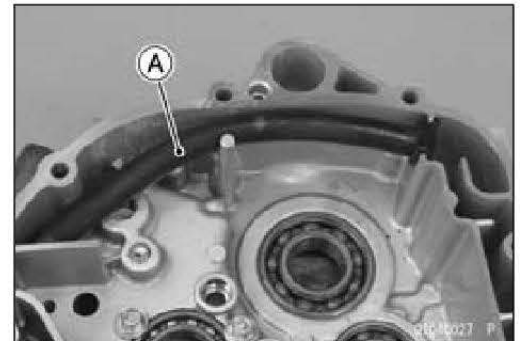


Crankcase Splitting

- Place it with the left crankcase facing downward.
- Split the crankcase halves using the pry points [A].



- Remove:
 - Balancer (see Balancer Removal(9-17))
 - Transmission (see Transmission Removal(9-26))
 - Crankshaft (see Crankshaft Removal(9-14))
 - Oil Return Hose [A]



NOTICE

Do not remove the bearing and oil seal in the crankcase unless it is absolutely necessary. Any removed parts should be replaced with new ones.

Crankcase Assembly

NOTICE

The right and left crankcase halves are machined at the factory in the assembled state, so the crankcase halves must be replaced as a set.

- With a high flash-point solvent, clean off the mating surfaces of the crankcase halves and wipe dry.
- Using compressed air, blow out the oil passages in the crankcase halves.

⚠ WARNING

Gasoline and low flash-point solvents can be flammable and/or explosive and cause severe burns. Clean the crankcase in a well-ventilated area, and take care that there is no spark or flame anywhere near the working areas. Do not use gasoline or low flash-point solvents to clean the crankcase.

9-10 CRANKSHAFT/TRANSMISSION

Crankcase Splitting

Left Crankcase Assembly

- Press the ball bearings until they are bottomed.
- Face the sealed side of the bearings [A] to the outside of the crankcase.
- Face the marked side of the bearing [B] to the inside of the crankcase.
- Press the ball bearings until they are bottomed.
 - Inside Diameter = 15 mm (0.59 in.) [C]
 - Inside Diameter = 25 mm (0.98 in.) [D]
- Face the marked side to the inside of the crankcase.

Special Tool - Bearing Driver Set: 57001-1129

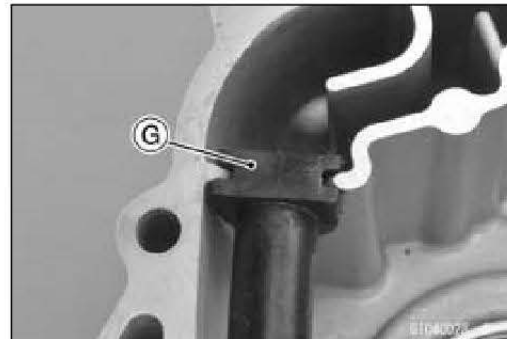
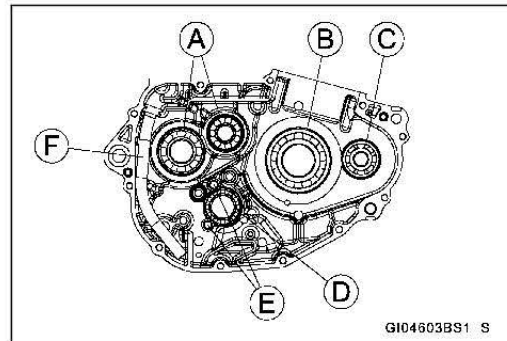
- Install:

**Torque - Shift Drum Bearing Retaining Bolts [E]: 9.8 N·m
(1.0 kgf·m, 87 in·lb)**

- Install:

Oil Return Hose [F]

- Face the flat side [G] of the oil return hose to inside of the crankcase.

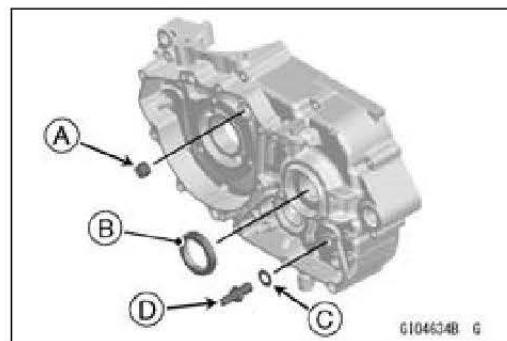


- Press the collar [A] so that its surface is flush with the crankcase.
- Press the oil seal [B] so that its surface is flush with the crankcase.
- Face the flat side to the outside of the crankcase.

Special Tool - Bearing Driver Set: 57001-1129

- Apply grease to the oil seal lips.
- Replace the washer [C] with a new one and install it.
- Apply a non-permanent locking agent to the shift shaft return spring pin [D].
- Tighten:

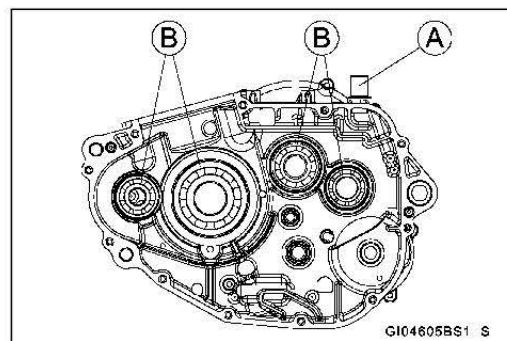
**Torque - Shift Shaft Return Spring Pin: 37 N·m (3.8 kgf·m,
27 ft·lb)**



Right Crankcase Assembly

- Press the breather hose fitting [A].
- Press the ball bearings [B] until they are bottomed.
- Face the marked side to the inside of the crankcase.

Special Tool - Bearing Driver Set: 57001-1129

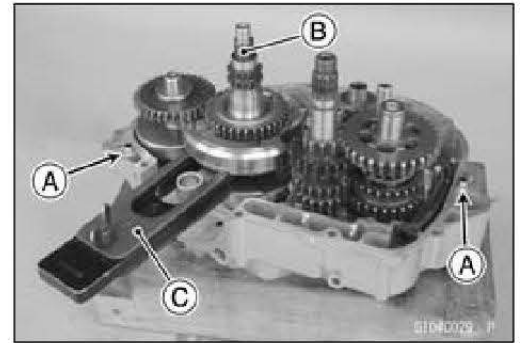


Crankcase Splitting

Crankcase Halves Assembly

- Install:
 - Crankshaft (see Crankshaft Installation(9-14))
 - Balancer (see Balancer Installation(9-17))
 - Transmission (see Transmission Installation(9-26))
 - Dowel Pins [A]
- Turn the crankshaft [B] to the BDC and install the crankshaft jig [C].

Special Tool - Crankshaft Jig: 57001-1174

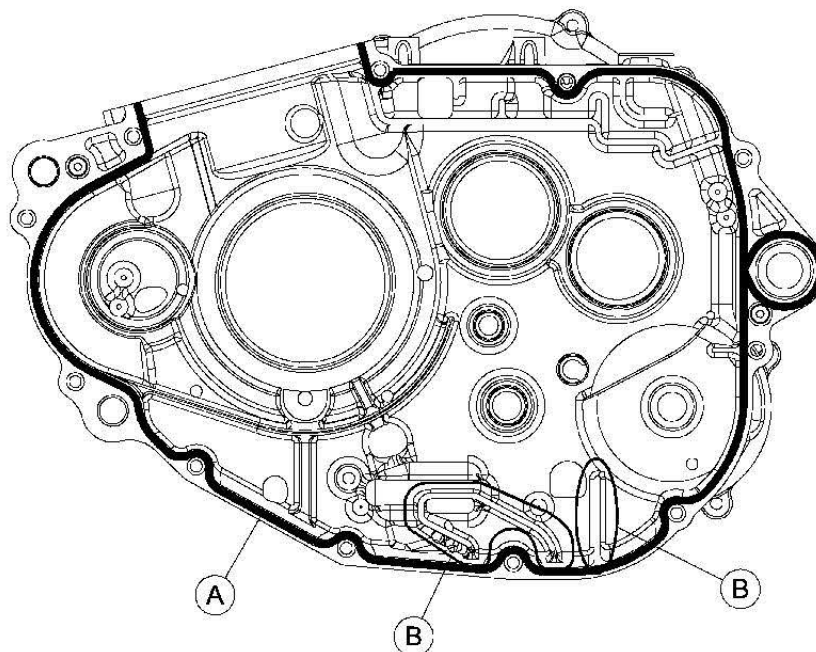


- Using a high flash-point solvent, clean off any oil or dirt that may be on the liquid gasket coating area. Dry them with a clean cloth.
- Apply liquid gasket [A] to the mating surface of the right crankcase half.

Sealant - Liquid Gasket, TB1216B: 92104-1064

NOTE

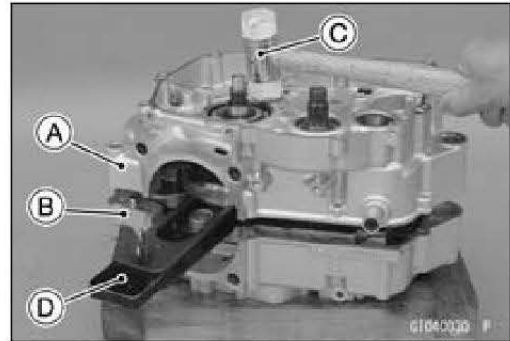
- Do not apply liquid gasket to the area [B].
- Make the application finish within 20 minutes when the liquid gasket to the mating surface of the right crankcase half is applied.
- Moreover fit the case and tighten the bolts just after application of the liquid gasket.



9-12 CRANKSHAFT/TRANSMISSION

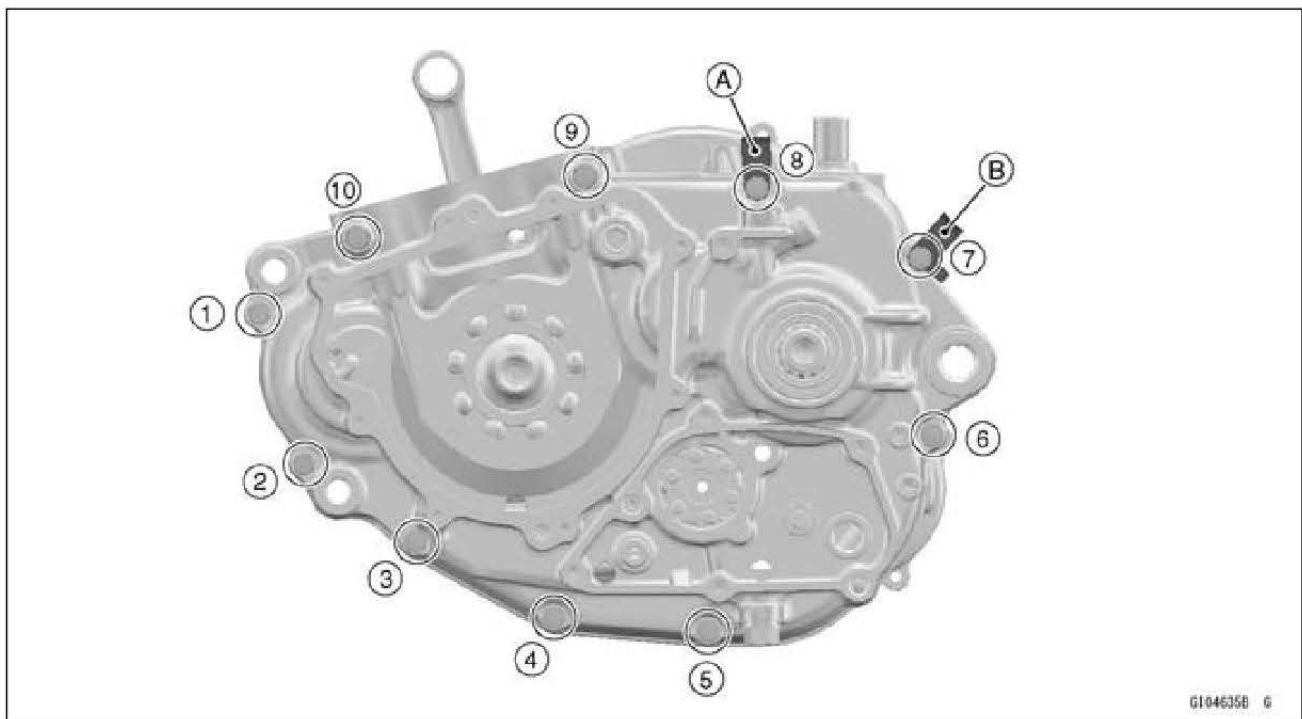
Crankcase Splitting

- Fit the right crankcase [A] to the left crankcase [B] so that they are in parallel.
- Tap around the crankshaft with a plastic hammer [C].
- Remove the crankcase jig [D].



- Install the clamp [A] and guide [B].
- Tighten the crankcase bolts and crankcase Allen bolts by the following sequence [1 ~ 10].
 - Crankcase Allen Bolt: L = 35 mm (1.4 in.) [1]
 - Crankcase Allen Bolt: L = 50 mm (2.0 in.) [2]
 - Crankcase Bolts: L = 50 mm (2.0 in.) [3 ~ 8]
 - Crankcase Bolts: L = 70 mm (2.8 in.) [9, 10]

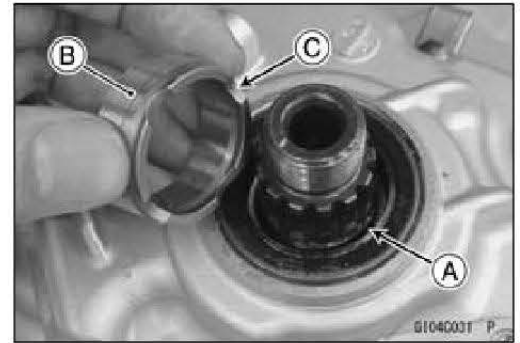
Torque - Crankcase Allen Bolts: 15 N·m (1.5 kgf·m, 11 ft·lb)
Crankcase Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)



- After tightening all crankcase bolts, check the following items.
 - Wipe up the liquid gasket that seeps out around the crankcase mating surface (especially the cylinder mounting portion).
 - Crankshaft and transmission shafts turn freely.
 - While spinning the output shaft, gears shift smoothly from the 1st to 6th gear, and 6th to 1st.
- ★ If the crankshaft will not turn smoothly, probably the crankshaft is not centered; tap the end of the crankshaft with a plastic hammer to reposition it.

Crankcase Splitting

- Replace the O-ring [A] with a new one and apply grease to it.
- Install:
 - O-ring
 - Collar [B]
- Face the dented side [C] to the inside of the engine.
- Apply engine oil to the connecting rod big end.
- Install the removed parts.

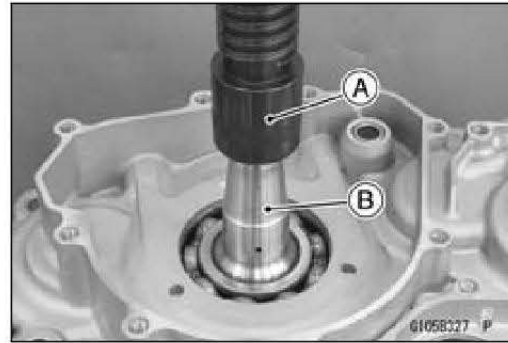


9-14 CRANKSHAFT/TRANSMISSION

Crankshaft/Connecting Rod

Crankshaft Removal

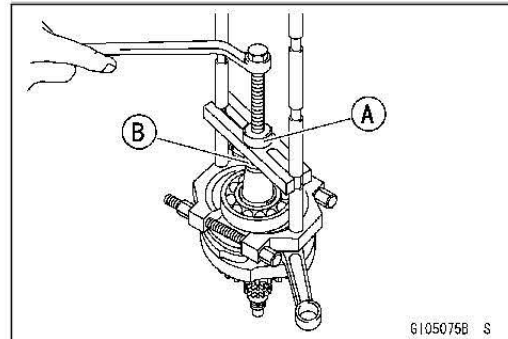
- Split the crankcase (see Crankcase Splitting(9-8)).
- Remove:
 - Transmission (see Transmission Removal(9-26))
 - Balancer (see Balancer Removal(9-17))
- Using a press [A], remove the crankshaft [B].



- ★If the bearings stay on the crankshaft when splitting the crankcase or removing the crankshaft from the left crankcase, remove the bearings from the crankshaft with a bearing puller [A] and adapter [B].

Special Tool - Bearing Puller: 57001-135

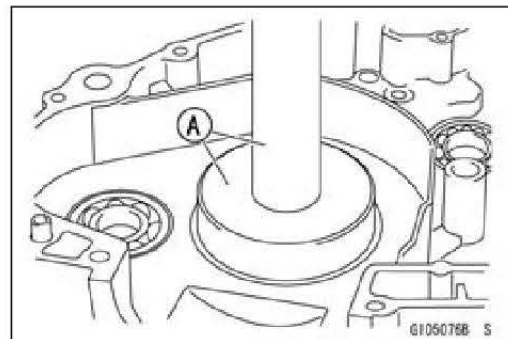
Bearing Puller Adapter: 57001-317



Crankshaft Installation

- Press the crankshaft ball bearing to the crankcase until it is bottomed.

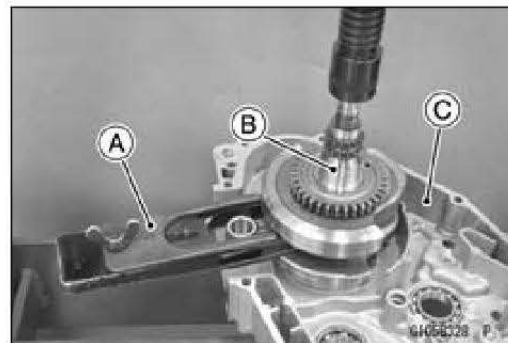
Special Tool - Bearing Driver Set [A]: 57001-1129



- Install the crankshaft jig [A] to the crankshaft [B].
- Lay the crankshaft jig in the direction of the cylinder.

Special Tool - Crankshaft Jig: 57001-1174

- Press the crankshaft into the left crankcase [C].



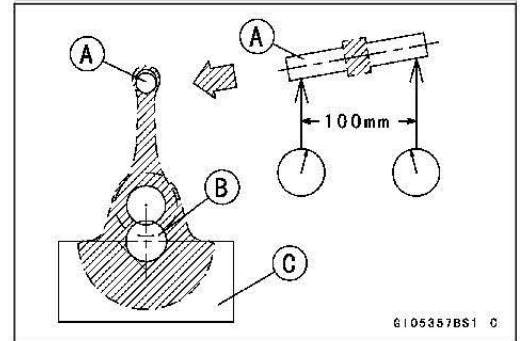
Crankshaft/Connecting Rod Cleaning

- Blow the crankshaft oil holes with compressed air to remove any foreign particles or residue that may have accumulated in the holes.

Crankshaft/Connecting Rod

Connecting Rod Bend Inspection

- Select an arbor [A] of the same diameter as the piston pin and at least 100 mm (3.94 in.) long, and insert the arbor through the connecting rod small end.
- On a surface plate, set the crankshaft journals [B] on V blocks [C].
- With the connecting rod held vertically, use a height gauge to measure the difference in the height of the arbor above the surface plate over a 100 mm (3.94 in.) length to determine the amount of connecting rod bend.



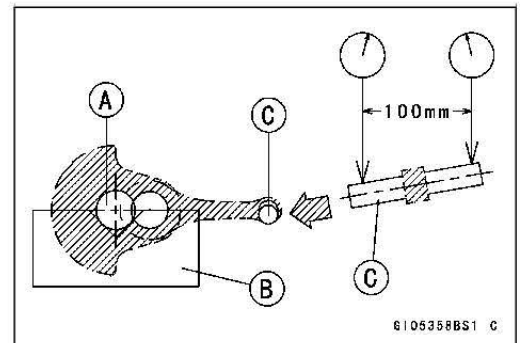
Connecting Rod Bend

Service Limit: TIR 0.2/100 mm (0.008/3.94 in.)

- ★ If connecting rod bend exceeds the service limit, replace the crankshaft assembly with a new one.

Connecting Rod Twist Inspection

- With the crankshaft journals [A] still on V block [B], hold the connecting rod horizontally and measure the amount that the arbor [C] varies from being paralleled with the surface plate over a 100 mm (3.94 in.) length of the arbor to determine the amount of connecting rod twist.



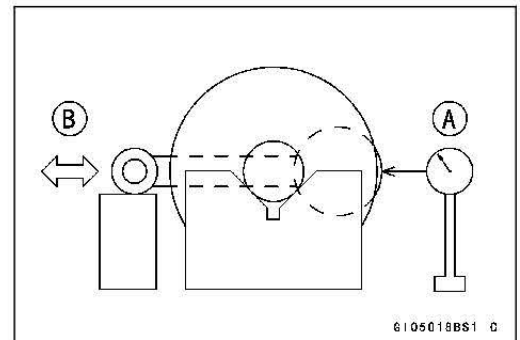
Connecting Rod Twist

Service Limit: TIR 0.2/100 mm (0.008/3.94 in.)

- ★ If connecting rod twist exceeds the service limit, replace the crankshaft assembly with a new one.

Connecting Rod Big End Radial Clearance Inspection

- On a surface plate, set the crankshaft on V blocks, and place a dial gauge [A] against the connecting rod big end.
- Push the connecting rod first towards the gauge and then in the opposite direction [B]. The difference between the two gauge readings is the radial clearance.



Connecting Rod Big End Radial Clearance

Standard: 0.008 ~ 0.020 mm (0.0003 ~ 0.0008 in.)

Service Limit: 0.07 mm (0.003 in.)

- ★ If radial clearance exceeds the service limit, replace the crankshaft assembly with a new one.

Connecting Rod Big End Side Clearance Inspection

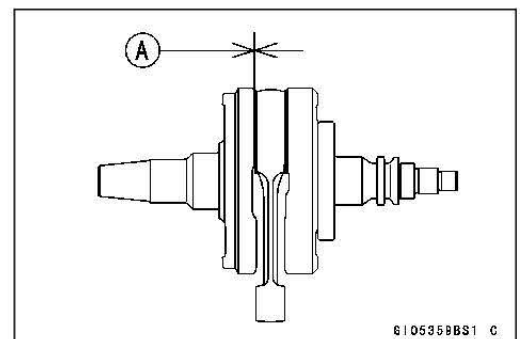
- Measure the side clearance [A] with a thickness gauge.

Connecting Rod Big End Side Clearance

Standard: 0.25 ~ 0.35 mm (0.0098 ~ 0.0138 in.)

Service Limit: 0.6 mm (0.02 in.)

- ★ If side clearance exceeds the service limit, the crankshaft assembly must be replaced.



9-16 CRANKSHAFT/TRANSMISSION

Crankshaft/Connecting Rod

Crankshaft Runout Inspection

- On a surface plate, set the crankshaft on V blocks, and place a dial gauge as shown.
 - 10 mm (0.4 in.) [A]
 - 14.5 mm (0.57 in.) [B]
- Turn the crankshaft slowly. The maximum difference in gauge readings is the crankshaft runout.

Crankshaft Runout

Standard:	TIR 0.03 mm (0.0012 in.) or less
Service Limit:	TIR 0.08 mm (0.0031 in.)

- ★ If the runout at either point exceeds the service limit, align the crankshaft so that the runout falls within the service limit (see Crankshaft Alignment(9-16)).

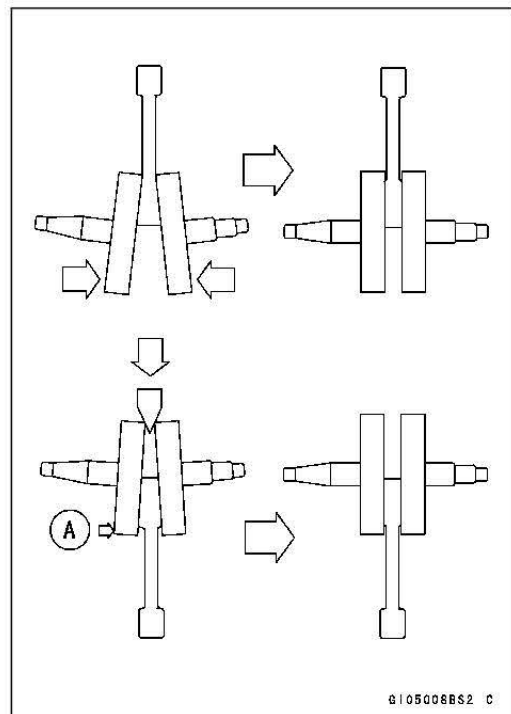
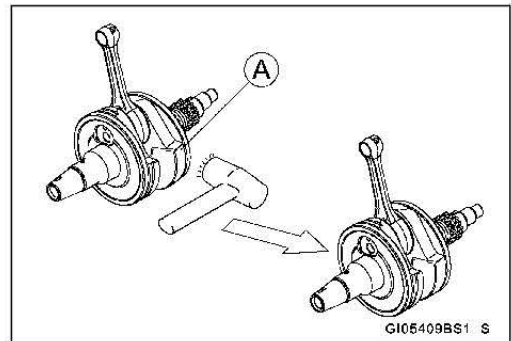
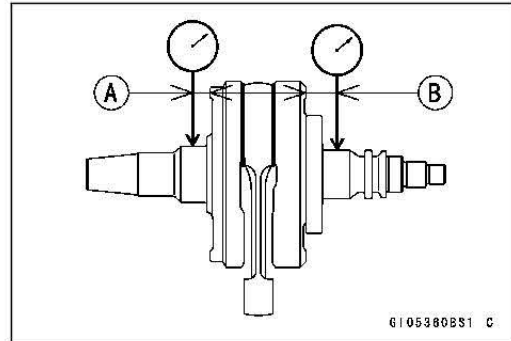
Crankshaft Alignment

- In the case of horizontal misalignment, which is the most common, strike the projecting rim [A] of the flywheel with a plastic, soft lead, or brass hammer as indicated.

- Recheck the runout with a dial gauge, repeating the process until the runout falls within the service limit.
- Vertical misalignment is corrected either by driving a wedge in between the flywheels or by squeezing the flywheel rims in a vise, depending on the nature of the misalignment. In both cases of horizontal and vertical misalignment, correct the horizontal misalignment first.
- ★ If flywheel misalignment cannot be corrected by the above method, replace the crankshaft itself.

NOTICE

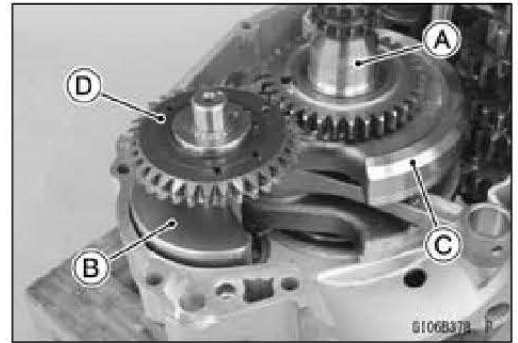
Do not hammer the flywheel at point [A].



Balancer

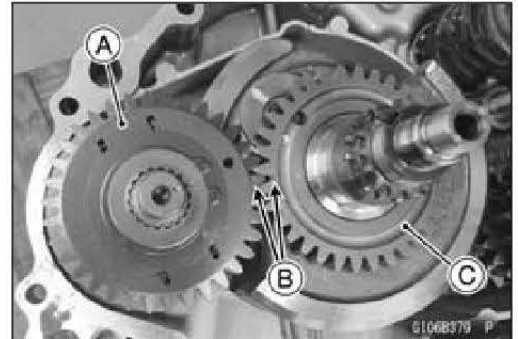
Balancer Removal

- Split the crankcase (see [Crankcase Splitting\(9-8\)](#)).
- Turn the crankshaft [A] to clear the balancer weight [B] from the crank web [C].
- Remove:
Balancer [D]



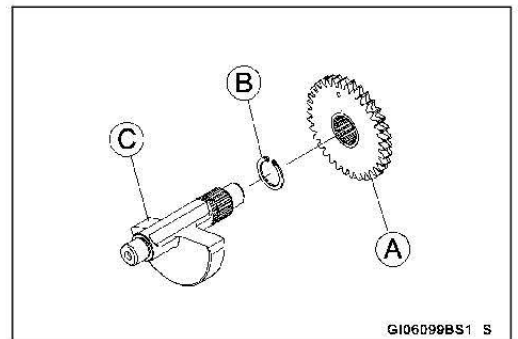
Balancer Installation

- Install the balancer [A] to the crankcase.
- Align the timing marks [B].
Crankshaft [C]
- Assemble the crankcase (see [Crankcase Assembly\(9-9\)](#)).



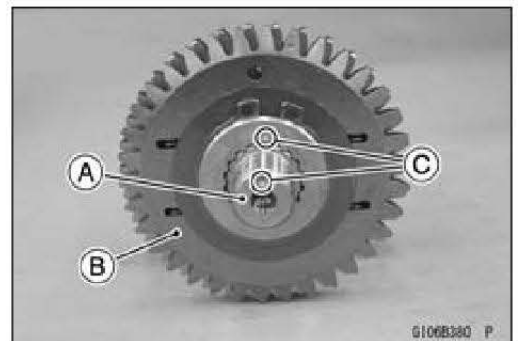
Balancer Disassembly

- Remove:
Balancer Gear [A]
Circlip [B]
Balancer Weight [C]
- Special Tool - Outside Circlip Pliers: 57001-144**



Balancer Assembly

- Replace the circlip with a new one.
- Special Tool - Outside Circlip Pliers: 57001-144**
- Install:
Balancer Shaft [A]
Balancer Gear [B]
 - Align the punch marks [C].



9-18 CRANKSHAFT/TRANSMISSION

Starter Motor Clutch

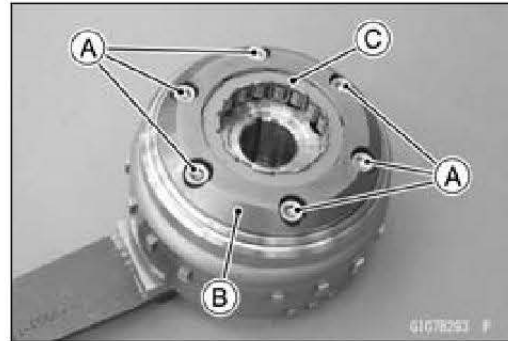
Starter Motor Clutch Removal

- Remove:
 - Alternator Rotor (see Alternator Rotor Removal(16-27))
- Hold the alternator rotor with the rotor holder.

Special Tools - Grip: 57001-1591

Rotor Holder: 57001-1723

- Remove:
 - Starter Motor Clutch Bolts [A]
 - Coupling [B]
 - Starter Motor Clutch [C]



Starter Motor Clutch Installation

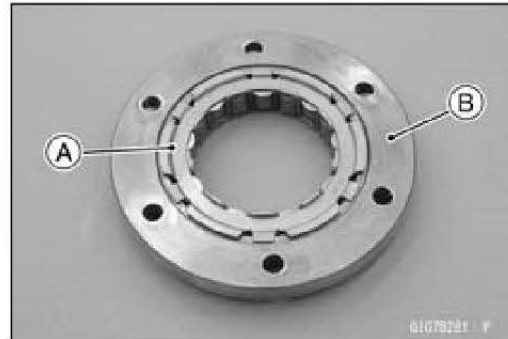
- Install the starter motor clutch [A] to the coupling [B] so that its flange fits into the coupling groove.
- Hold the alternator rotor with the rotor holder.

Special Tools - Grip: 57001-1591

Rotor Holder: 57001-1723

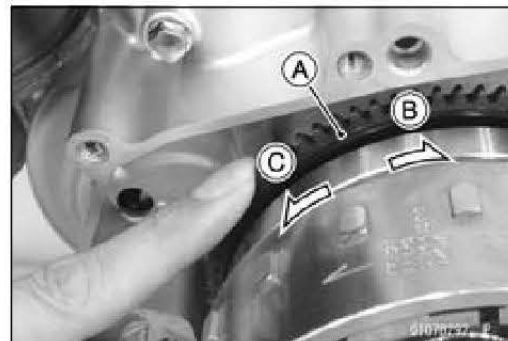
- Apply a non-permanent locking agent to the starter motor clutch bolts.
- Tighten:

Torque - Starter Motor Clutch Bolts: 12 N·m (1.2 kgf·m, 106 in·lb)



Starter Motor Clutch Inspection

- Remove:
 - Alternator Cover (see Alternator Cover Removal(16-24))
- Turn the starter motor clutch gear [A] by hand. The starter motor clutch gear should turn clockwise [B] freely, but should not turn counterclockwise [C].
- ★ If the starter motor clutch does not operate as it should or if it makes noise, go to the next step.
- Disassemble the starter motor clutch, and visually inspect the clutch parts.
- ★ If there is any worn or damaged part, replace it.



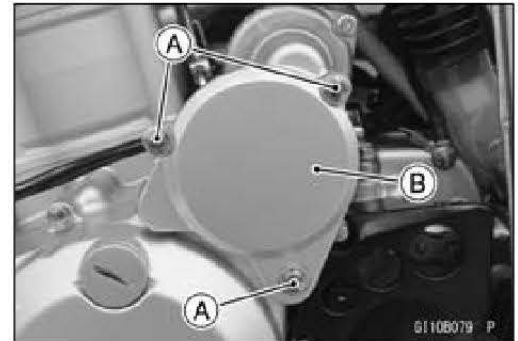
NOTE

○Examine the starter motor clutch gear as well. Replace it if it worn or damaged.

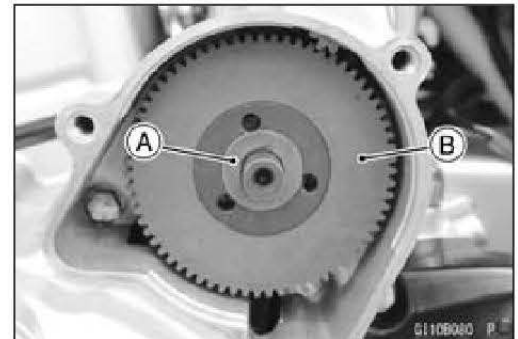
Torque Limiter

Torque Limiter Removal

- Remove:
 - Torque Limiter Cover Bolts [A]
 - Torque Limiter Cover [B]

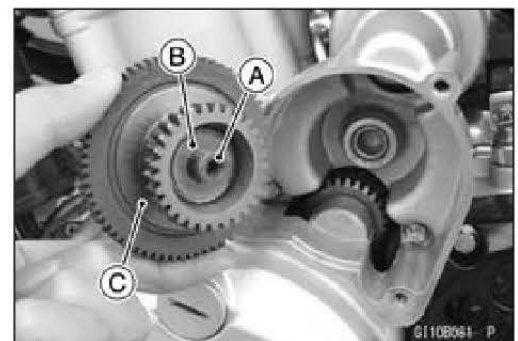


- Remove:
 - Washer [A]
 - Torque Limiter [B]
- There are washers set on both sides of the torque limiter.

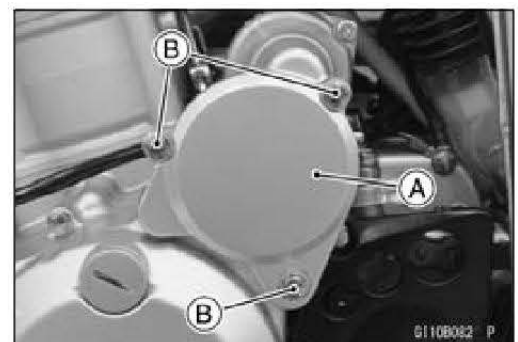


Torque Limiter Installation

- Apply molybdenum disulfide grease to both sides of the torque limiter journal [A].
- Replace the torque limiter cover gasket with a new one.
- Install:
 - Washers [B] (Both Sides of Torque Limiter)
 - Torque Limiter [C]

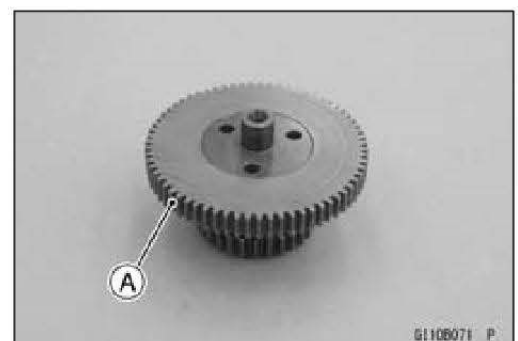


- Install:
 - Torque Limiter Cover Gasket
 - Torque Limiter Cover [A]
- Tighten:
 - Torque - Torque Limiter Cover Bolts [B]: 9.8 N·m (1.0 kgf·m, 87 in·lb)



Torque Limiter Inspection

- Visually inspect the torque limiter [A].
- ★ If the torque limiter has wear, discoloration, or damage, replace it.



9-20 CRANKSHAFT/TRANSMISSION

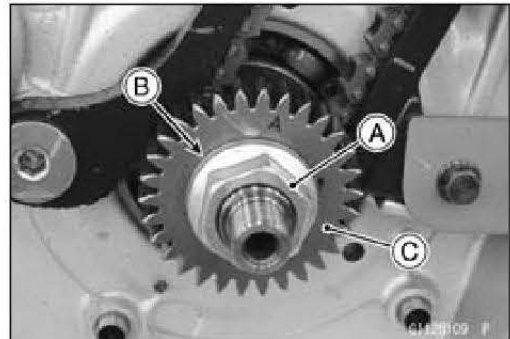
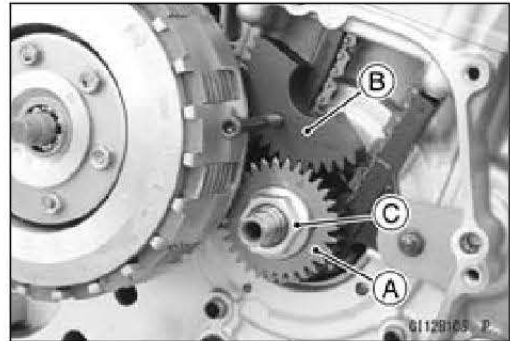
Primary Gear

Primary Gear Removal

- Remove:
 - Right Engine Cover (see [Right Engine Cover Removal\(6-9\)](#))
 - Oil Pump (see [Oil Pump Removal\(7-11\)](#))
- Hold the primary gear [A] with the gear holder [B], loosen the primary gear nut [C].

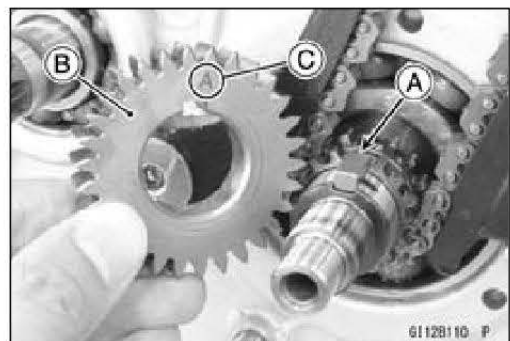
**Special Tool - Gear Holder: 57001-1602 or
Gear Holder: 57001-1904**

- Remove:
 - Clutch (see [Clutch Removal\(6-14\)](#))
 - Primary Gear Nut [A]
 - Washer [B]
 - Primary Gear [C]
 - Woodruff Key

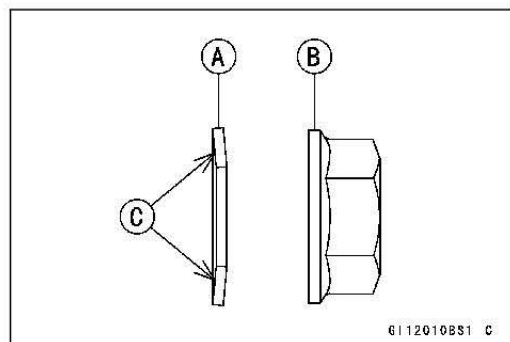


Primary Gear Installation

- Install:
 - Woodruff Key [A]
 - Primary Gear [B]
- Face the mark [C] outward.



- Replace the washer [A] with a new one.
- Install:
 - Washer
 - Primary Gear Nut [B]
- Face the concaved side [C] inward.

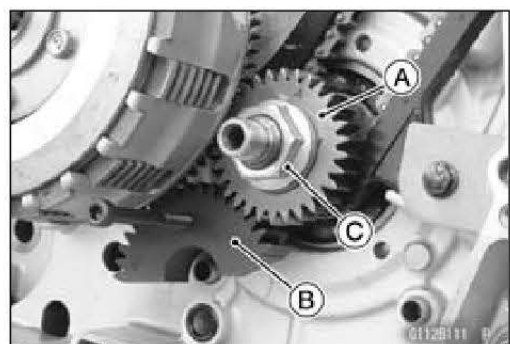


- Install:
 - Clutch (see [Clutch Installation\(6-14\)](#))
- Hold the primary gear [A] with the gear holder [B], tighten the primary gear nut [C].

**Special Tool - Gear Holder: 57001-1602 or
Gear Holder: 57001-1904**

Torque - Primary Gear Nut: 98 N·m (10 kgf·m, 72 ft·lb)

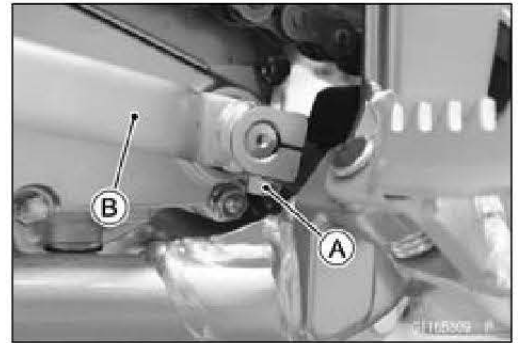
- Install the removed parts.



External Shift Mechanism

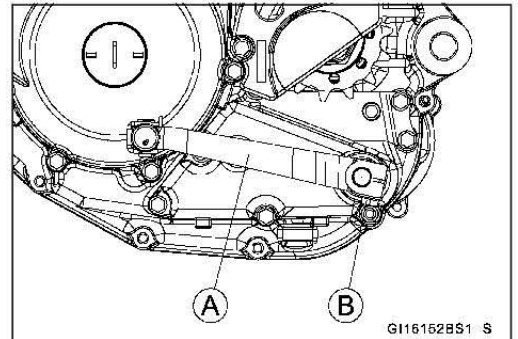
Shift Pedal Removal

- Remove:
 - Shift Pedal Bolt [A]
 - Shift Pedal [B]



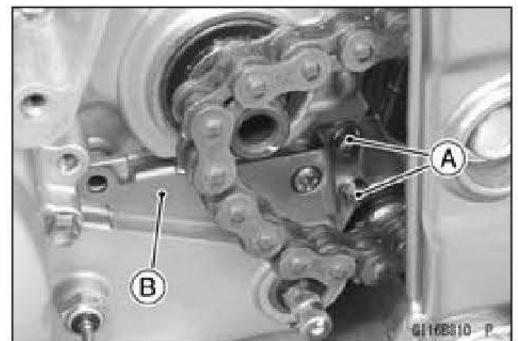
Shift Pedal Installation

- Install the shift pedal [A] as shown.
- Tighten:
 - Torque - Shift Pedal Bolt [B]: 12 N·m (1.2 kgf·m, 106 in·lb)

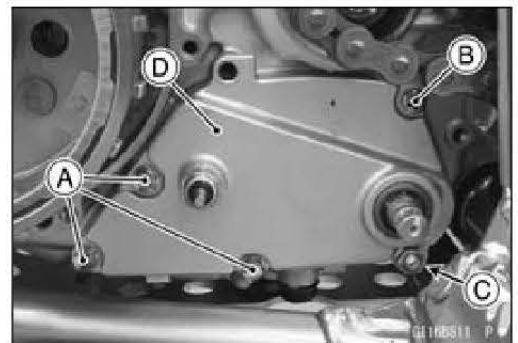


External Shift Mechanism Removal

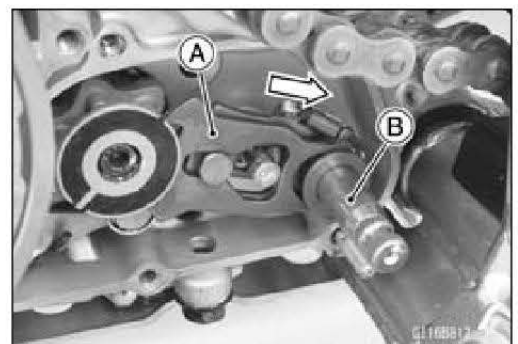
- Remove:
 - Shift Pedal (see Shift Pedal Removal(9-21))
 - Alternator Cover (see Alternator Cover Removal(16-24))
 - Engine Sprocket (see Engine Sprocket Removal(11-10))
 - Drive Chain Guard Plate Bolts [A]
 - Drive Chain Guard Plate [B]



- Remove:
 - External Shift Mechanism Cover Bolts [A]
 - External Shift Mechanism Cover Screw [B]
 - External Shift Mechanism Cover Nut [C]
 - External Shift Mechanism Cover [D]



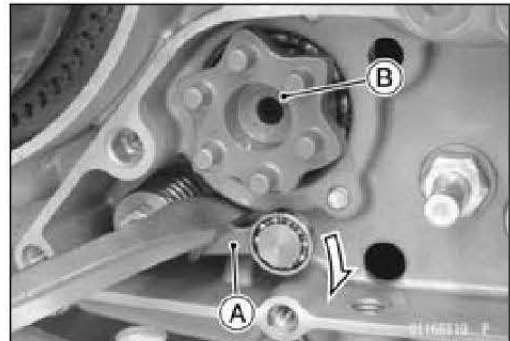
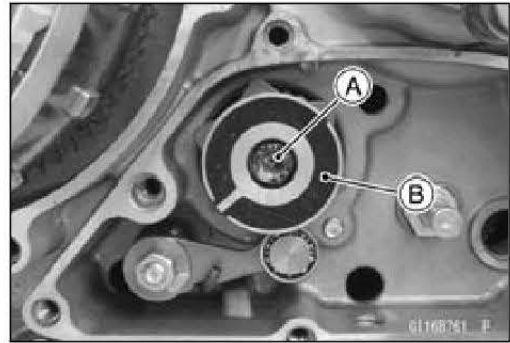
- While pushing the shift mechanism arm [A], remove the shift shaft assembly [B].



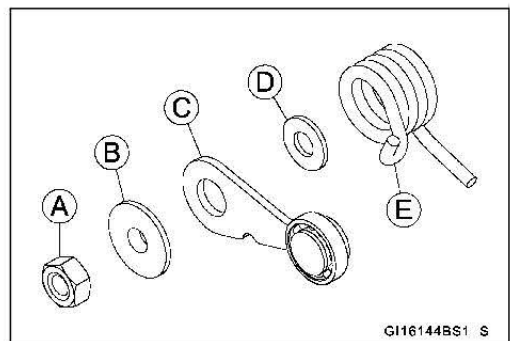
9-22 CRANKSHAFT/TRANSMISSION

External Shift Mechanism

- Remove:
 - Shift Drum Cam Holder Bolt [A]
 - Shift Drum Cam Holder [B]
 - Pin
- While pushing down the gear positioning lever [A], remove the shift drum cam [B] and pin.



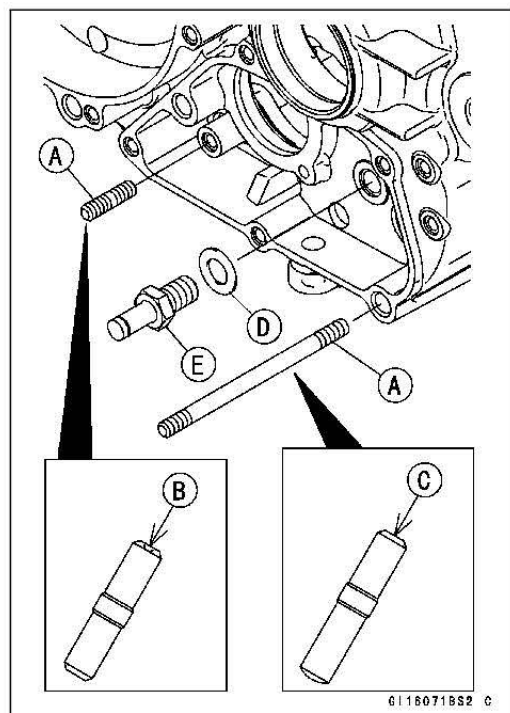
- Remove:
 - Gear Positioning Lever Nut [A]
 - Spacer [B]
 - Gear Positioning Lever [C]
 - Washer [D]
 - Spring [E]



External Shift Mechanism Installation

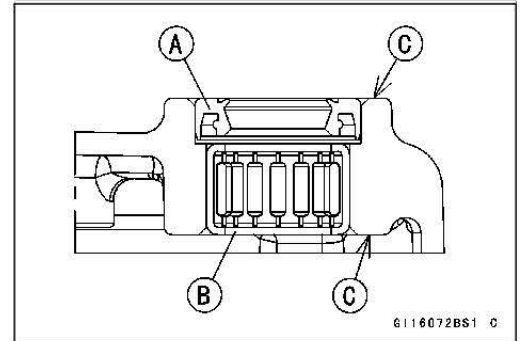
- Install the studs [A] until they are bottomed.
 - Face the punch mark [B] inward.
 - Face the flat side [C] inward.
- Replace the washer [D] with a new one.
- Apply a non-permanent locking agent to the shift shaft return spring pin [E].
- Tighten:

Torque - Shift Shaft Return Spring Pin: 37 N·m (3.8 kgf·m, 27 ft·lb)



External Shift Mechanism

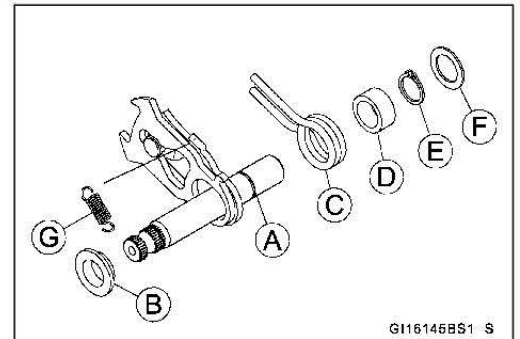
- Replace the oil seal [A] and needle bearing [B] on the external shift mechanism cover if they are removed.
- Press the oil seal and needle bearing flush with the cover surfaces [C].
- Face the marked side of the needle bearing to the inside of the external shift mechanism cover.
- Apply grease to the oil seal lips.



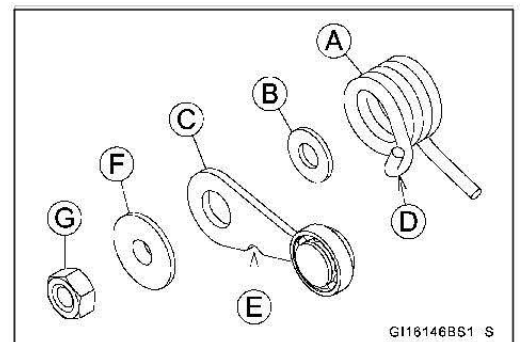
- Assemble:
 - Shift Shaft [A]
 - Flanged Collar [B]
 - Shift Shaft Return Spring [C]
 - Collar [D]
 - New Circlip [E]
 - Washer [F]
 - Spring [G]

○ Note the spring direction.

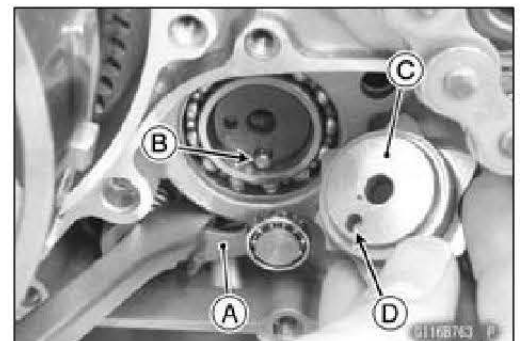
Special Tool - Outside Circlip Pliers: 57001-144



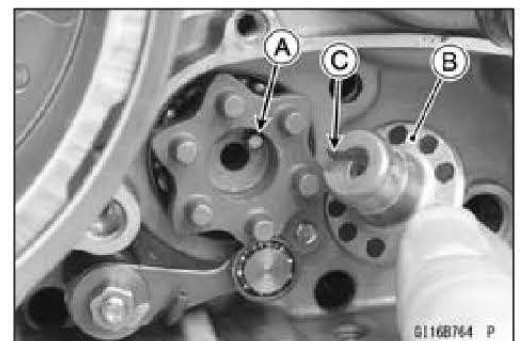
- Install:
 - Spring [A]
 - Washer [B]
 - Gear Positioning Lever [C]
- Fit the hook [D] and dent [E].
- Install the spacer [F] so that the flat side faces outward.
- Tighten:
 - Torque - Gear Positioning Lever Nut [G]: 9.8 N·m (1.0 kgf·m, 87 in·lb)**



- While pushing down the gear positioning lever [A], install the pin [B] and shift drum cam [C].
- Fit the hole [D] and pin.



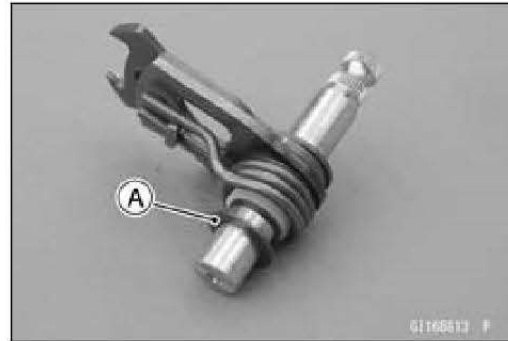
- Install the pin [A] to the shift drum cam.
- Install the shift drum cam holder [B].
- Fit the slit [C] and pin.
- Apply a non-permanent locking agent to the shift drum cam holder bolt and tighten it.
- Torque - Shift Drum Cam Holder Bolt: 12 N·m (1.2 kgf·m, 106 in·lb)**



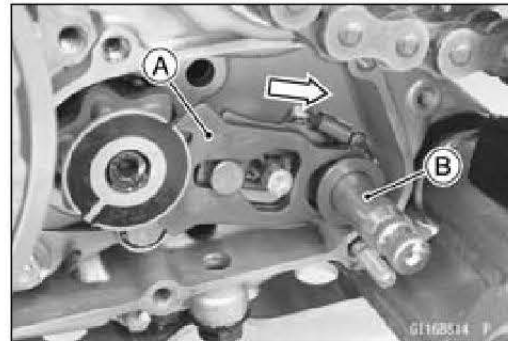
9-24 CRANKSHAFT/TRANSMISSION

External Shift Mechanism

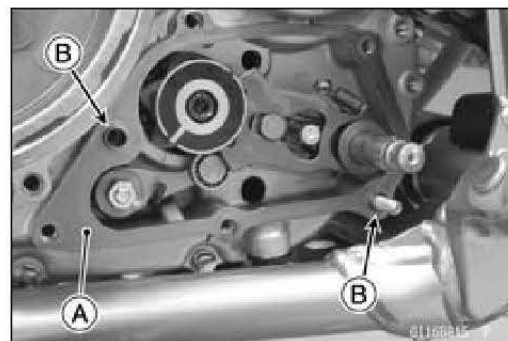
- Make sure the washer [A] is installed to the shift shaft.



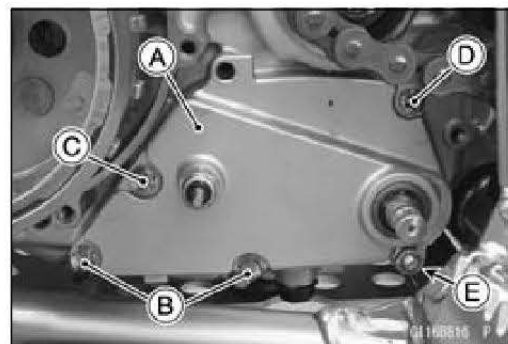
- While pushing the shift mechanism arm [A], install the shift shaft assembly [B].



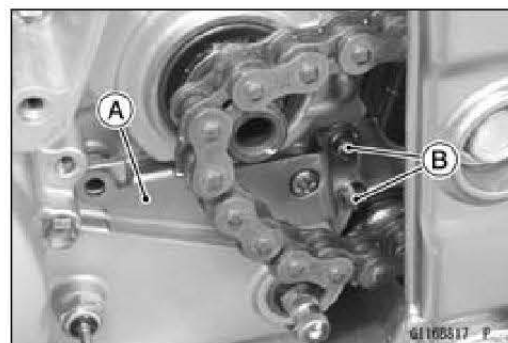
- Replace the gasket [A] with a new one.
- Install:
 - Gasket
 - Dowel Pins [B]



- Install the external shift mechanism cover [A].
- Tighten:
 - Torque - External Shift Mechanism Cover Bolts (L = 20 mm)**
[B]: 9.8 N·m (1.0 kgf·m, 87 in·lb)
 - External Shift Mechanism Cover Bolt (L = 30 mm)**
[C]: 9.8 N·m (1.0 kgf·m, 87 in·lb)
 - External Shift Mechanism Cover Screw [D]:** 5.2 N·m (0.53 kgf·m, 46 in·lb)
 - External Shift Mechanism Cover Nut [E]:** 9.8 N·m (1.0 kgf·m, 87 in·lb)



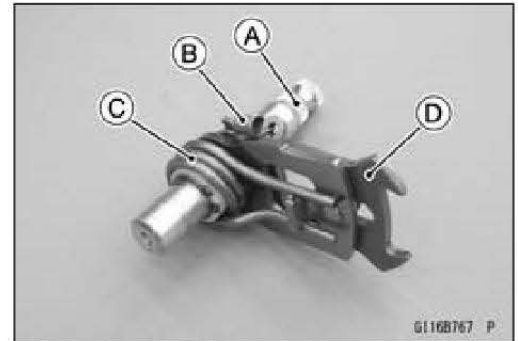
- Install the drive chain guard plate [A] and drive chain guard plate bolt [B].
- Tighten:
 - Torque - Drive Chain Guard Plate Bolts:** 9.8 N·m (1.0 kgf·m, 87 in·lb)
- Install the removed parts.



External Shift Mechanism

External Shift Mechanism Inspection

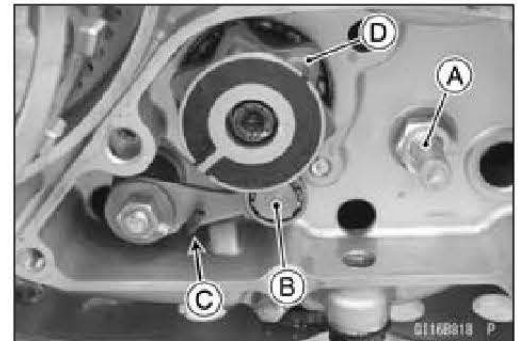
- Inspect the shift shaft assembly for any damage.
- ★ If the shift shaft [A] is bent, replace it with a new one.
- ★ If the spring [B] or shift shaft return spring [C] is damaged, replace it with a new one.
- ★ If the shift mechanism arm [D] is damaged, replace the shift shaft.



- Check that the shift shaft return spring pin [A] is not loose.
- ★ If it is loose, remove it, apply a non-permanent locking agent, and tighten it.

Torque - Shift Shaft Return Spring Pin: 37 N·m (3.8 kgf·m, 27 ft·lb)

- Check the gear positioning lever [B] and spring [C] for any damage.
- ★ If it shows any signs of damage, replace it with a new one.
- Visually inspect the shift drum cam [D].
- ★ If it is badly worn or if it shows any damage, replace it.

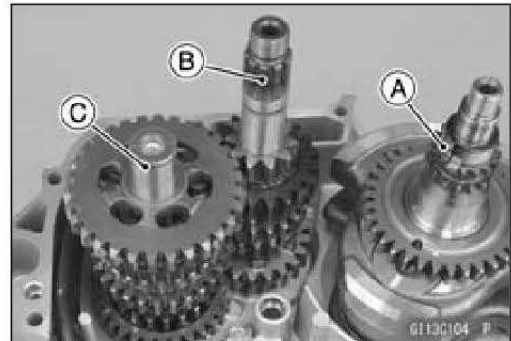
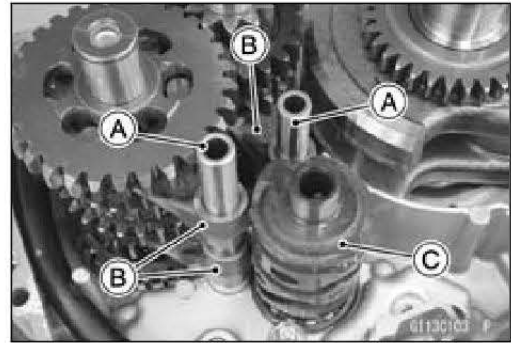


9-26 CRANKSHAFT/TRANSMISSION

Transmission

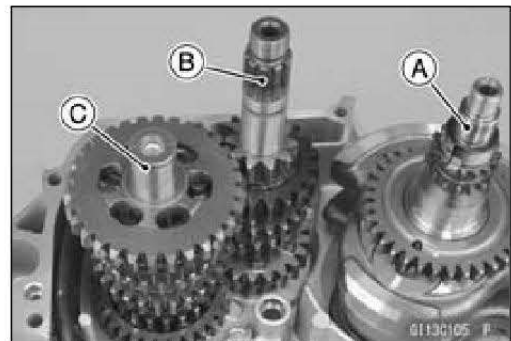
Transmission Removal

- Split the crankcase (see Crankcase Splitting(9-8)).
- Remove:
 - Shift Rods [A]
 - Shift Forks [B]
 - Shift Drum [C]
- Turn the crankshaft [A] to clear the crank web from the drive shaft [B].
- Remove:
 - Drive Shaft Assembly
 - Output Shaft Assembly [C]



Transmission Installation

- Apply engine oil to the sliding surfaces on the transmission shafts and gears.
- Turn the crankshaft [A] to clear the crank web from the drive shaft mounting portion.
- Engage the drive shaft [B] and output shaft [C], and install them as a set.
- Be sure the washer is in the bottom of the drive shaft.
- Be sure the shim is in the top of the output shaft.



- The shift forks can be identified by their shapes.

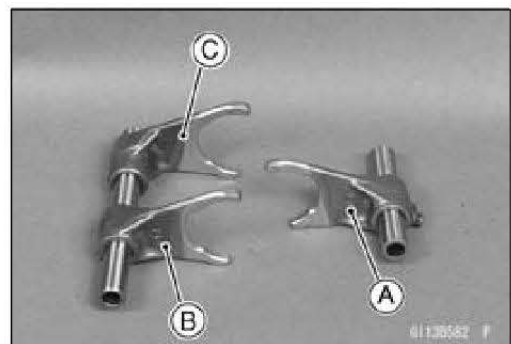
Drive shaft

3/4th gear shift fork [A] Shorter ears

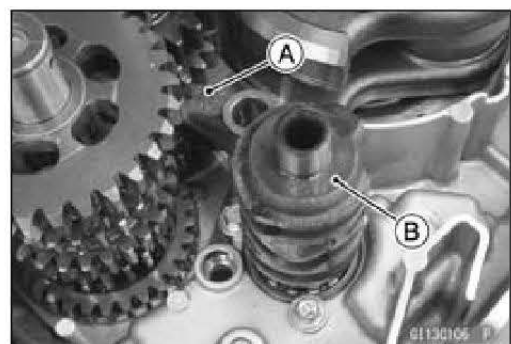
Output shaft

6th gear shift fork [B] Guide pin has the center of the width.

5th gear shift fork [C] Guide pin has at the same height as the ears.

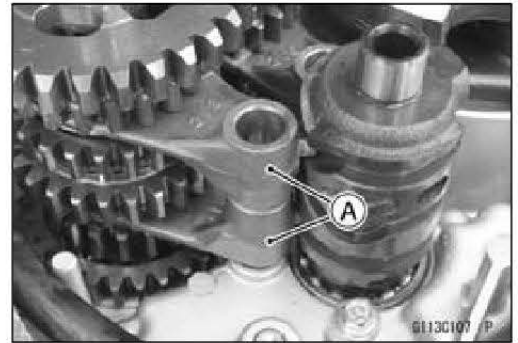


- Apply engine oil to the shift fork and shift drum.
- Install:
 - Input Shaft Shift Fork [A]
 - Shift Drum [B]



Transmission

- Apply engine oil to the shift forks and shift rods.
- Install:
 - Output Shaft Shift Forks [A]
 - Shift Rods
- Assemble the crankcase (see [Crankcase Assembly\(9-9\)](#)).



Transmission Disassembly

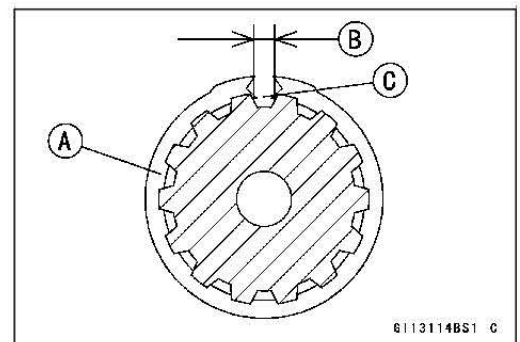
- Remove the transmission shafts (see [Transmission Removal\(9-26\)](#)).
- Using the circlip pliers, remove the snap rings and disassemble the transmission shafts.

Special Tool - Outside Circlip Pliers: 57001-144

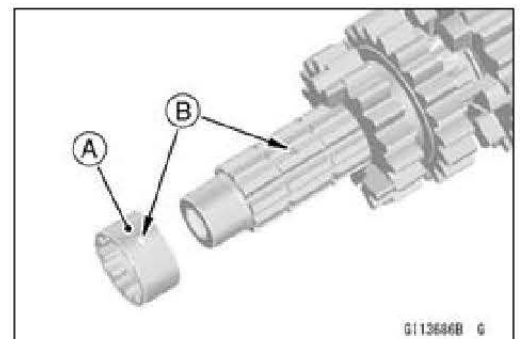
Transmission Assembly

- Apply engine oil to the transmission shafts and gears.
 - Replace the snap rings with new ones.
 - Assemble the transmission.
- The drive shaft gears can be recognized by size: the gear with the smallest diameter is 1st gear, and the largest one is 6th gear. Be sure that all parts are put back in the correct sequence and all snap rings and washers are properly in place.
- The output shaft gears can be recognized by size: the gear with the largest diameter is 1st gear, and the smallest one is 6th gear. Be sure that all parts are put back in the correct sequence and all snap rings and washers are properly in place.
- When installing the snap rings [A], align its opening [B] with a spline groove [C].

Special Tool - Outside Circlip Pliers: 57001-144



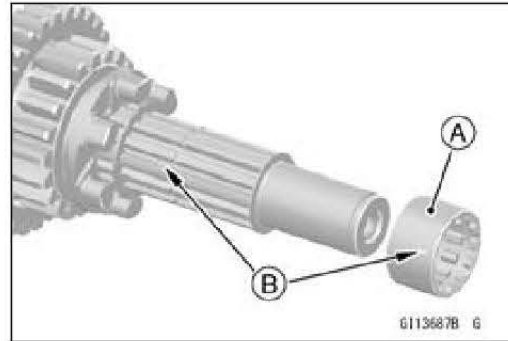
- When installing the 6th gear bushing [A] onto the drive shaft, align their oil holes [B].
- After assembling, check that each gear spins or slides freely on the transmission shafts without binding.



9-28 CRANKSHAFT/TRANSMISSION

Transmission

- When installing the 3rd/4th gear bushing [A] onto the output shaft, align their oil holes [B].
- After assembling, check that each gear spins or slides freely on the transmission shafts without binding.

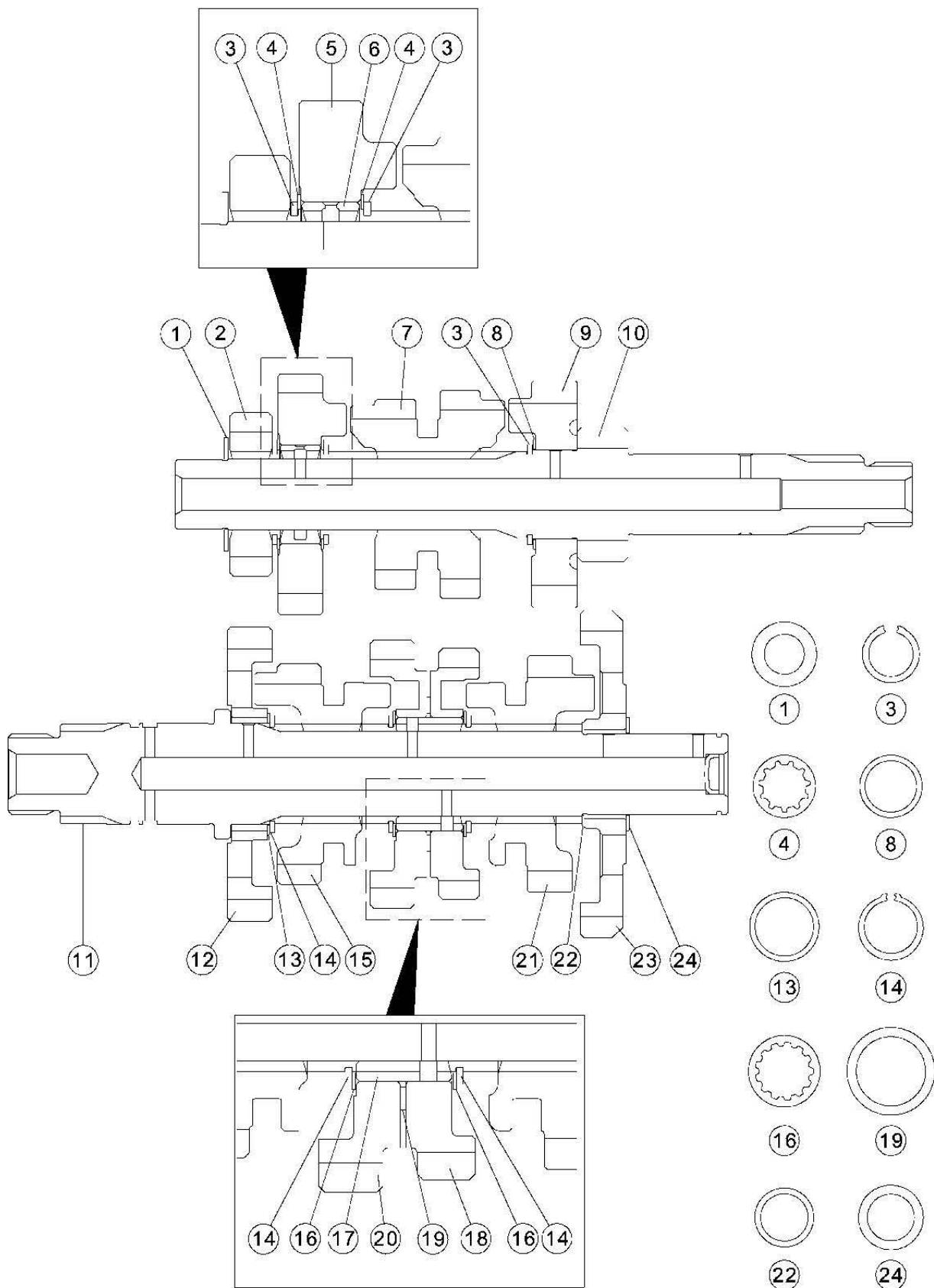


Transmission

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9-30 CRANKSHAFT/TRANSMISSION

Transmission



Transmission

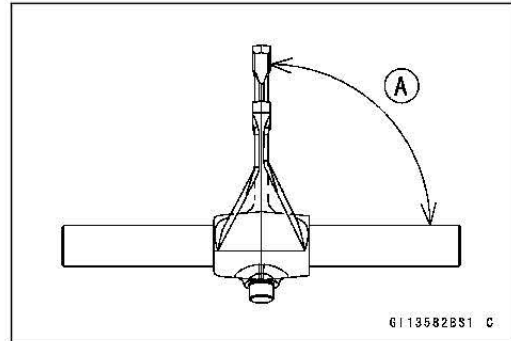
1. Washer, $\phi 28$ mm (1.10 in.)
2. 2nd Gear
3. Snap Ring, $\phi 24.6$ mm (0.969 in.)
4. Toothed Washer, $\phi 27$ mm (1.06 in.)
5. 6th Gear
6. Bushing
7. 3rd/4th Gear
8. Washer, $\phi 27$ mm (1.06 in.)
9. 5th Gear
10. 1st Gear (Drive Shaft)
11. Output Shaft
12. 2nd Gear
13. Washer, $\phi 30$ mm (1.18 in.)
14. Snap Ring, $\phi 28$ mm (1.10 in.)
15. 6th Gear
16. Toothed Washer, $\phi 31$ mm (1.22 in.)
17. Bushing
18. 4th Gear
19. Spacer, $\phi 38$ mm (1.5 in.)
20. 3rd Gear
21. 5th Gear
22. Washer, $\phi 25.5$ mm (1.00 in.)
23. 1st Gear
24. Shim, $\phi 28$ mm (1.10 in.)

9-32 CRANKSHAFT/TRANSMISSION

Transmission

Shift Fork Bending Inspection

- Visually inspect the shift forks, and replace any fork that is bent. A bent fork could cause difficulty in shifting or allow the transmission to jump out of gear under power. 90° [A]



Shift Fork/Gear Groove Wear Inspection

- Measure the thickness of the shift fork ears [A], and measure the width of the gear groove [B].

Shift Fork Ear Thickness

Standard: 4.9 ~ 5.0 mm (0.19 ~ 0.20 in.)

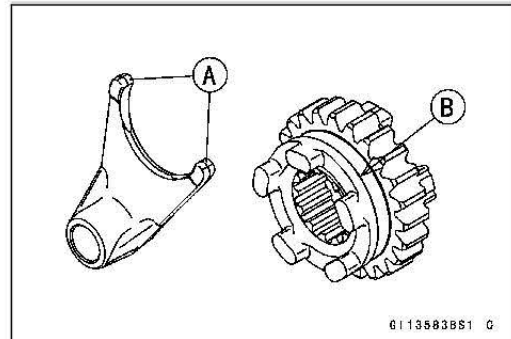
Service Limit: 4.8 mm (0.19 in.)

Gear Groove Width

Standard: 5.05 ~ 5.15 mm (0.199 ~ 0.203 in.)

Service Limit: 5.3 mm (0.21 in.)

- ★ If the thickness of a shift fork ear is less than the service limit, the shift fork must be replaced.
- ★ If the gear groove is worn over the service limit, the gear must be replaced.



Shift Fork Guide Pin/Drum Groove Wear Inspection

- Measure the diameter of each shift fork guide pin [A], and measure the width of each shift drum grooves [B].

Shift Fork Guide Pin Diameter

Standard: 5.9 ~ 6.0 mm (0.23 ~ 0.24 in.)

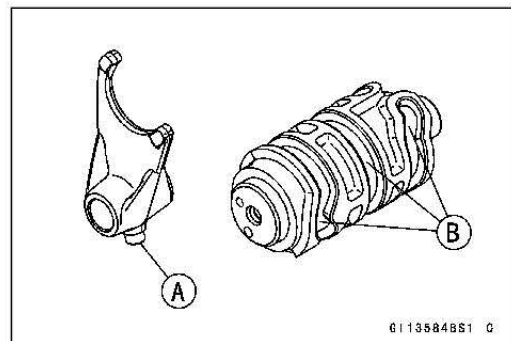
Service Limit: 5.8 mm (0.23 in.)

Shift Drum Groove Width

Standard: 6.05 ~ 6.20 mm (0.238 ~ 0.244 in.)

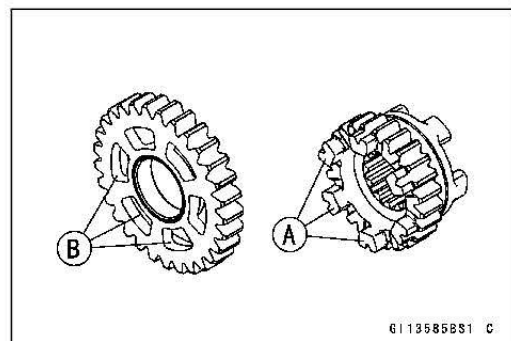
Service Limit: 6.3 mm (0.25 in.)

- ★ If the guide pin diameter is less than the service limit, the shift fork must be replaced.
- ★ If the shift drum groove is worn over the service limit, the drum must be replaced.



Gear Dog and Gear Dog Hole Damage Inspection

- Visually inspect the gear dogs [A] and gear dog holes [B].
- ★ Replace any damaged gears or gears with excessively worn dogs or dog holes.



Ball Bearing, Needle Bearing, and Oil Seal

Ball and Needle Bearing Wear Inspection

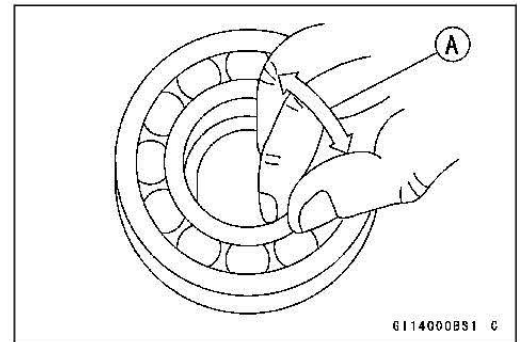
NOTICE

Do not remove the bearings for inspection. Removal may damage them.

- Check the ball bearings.
- Since the ball bearings are made to extremely close tolerances, the wear must be judged by feel rather than measurement. Clean each bearing in a high flash-point solvent, dry it (do not spin the bearing while it is dry), and oil it with engine oil.
- Spin [A] the bearing by hand to check its condition.
- ★ If the bearing is noisy, does not spin smoothly, or has any rough spots, replace it.
- Check the needle bearings.
- The rollers in a needle bearing normally wear very little, and wear is difficult to measure. Instead of measuring, inspect the bearing for abrasion, color change, or other damage.
- ★ If there is any doubt as to the condition of a needle bearing, replace it.

Oil Seal Inspection

- Inspect the oil seals.
- ★ Replace it if the lips are misshapen, discolored (indicating that the rubber has deteriorated), hardened or otherwise damaged.



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Wheels/Tires

Table of Contents

Exploded View	10-2
Specifications	10-4
Special Tools	10-6
Wheels (Rims)	10-7
Front Wheel Removal	10-7
Front Wheel Installation	10-7
Rear Wheel Removal	10-9
Rear Wheel Installation	10-10
Wheel Inspection	10-11
Spoke Inspection	10-11
Rim Inspection	10-11
Rim Installation Position Inspection	10-11
Axle Inspection	10-12
Tires	10-13
Air Pressure Inspection/Adjustment	10-13
Tire Inspection	10-13
Tire Removal	10-13
Tire Installation	10-14
Hub Bearing	10-15
Hub Bearing Removal	10-15
Hub Bearing Installation	10-15
Hub Bearing Inspection	10-16
Hub Bearing Lubrication	10-17

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Spoke Nipples	4.0	0.41	35 in·lb	
2	Front Axle Nut	88	9.0	65	
3	Front Axle Clamp Bolts	20	2.0	15	AL
4	Rear Axle Nut	110	11.2	81.1	R

5. KLX300D

6. KLX300E

AL: Tighten the two clamp bolts alternately two times to ensure even tightening torque.

G: Apply grease.

HG: Apply high-temperature grease.

R: Replacement Parts

WL: Apply soap and water solution or rubber lubricant.

10-4 WHEELS/TIRES

Specifications

Item	Standard
Wheels (Rims)	
Rim Runout:	
Axial	TIR 1.0 mm (0.04 in.) or less [Service Limit: TIR 2.0 mm (0.08 in.)]
Radial	TIR 1.0 mm (0.04 in.) or less [Service Limit: TIR 2.0 mm (0.08 in.)]
Axle Runout/100 mm (3.94 in.)	TIR 0.03 mm (0.001 in.) or less [Service Limit: TIR 0.2 mm (0.008 in.)]
Rim Size (KLX300D):	
Front	21 × 1.60
Rear	18 × 2.15
Rim Size (KLX300E):	
Front	17M/C × MT3.00
Rear	17M/C × MT4.00
Tires (KLX300D)	
Air Pressure (when cold):	
Front	150 kPa (1.50 kgf/cm ² , 22 psi)
Rear	Up to 97.5 kg (215 lb) load: 150 kPa (1.50 kgf/cm ² , 22 psi) 97.5 ~ 184 kg (215 ~ 406 lb) load: 175 kPa (1.75 kgf/cm ² , 25 psi)
Tread Depth:	
Front	7.8 mm (0.31 in.) [Service Limit: 2 mm (0.08 in.)]
Rear	11.8 mm (0.46 in.) [Service Limit: 2 mm (0.08 in.)]
Standard Tires:	
Make	DUNLOP
Type:	
Front	D605FG
Rear	D605G
Size:	
Front	3.00-21 51P
Rear	4.60-18 63P
Tires (KLX300E)	
Air Pressure (when cold):	
Front	200 kPa (2.0 kgf/cm ² , 29 psi)
Rear	225 kPa (2.25 kgf/cm ² , 33 psi)
Tread Depth:	
Front	4.4 mm (0.17 in.) [Service Limit: 1 mm (0.04 in.)]
Rear	6.5 mm (0.26 in.) [Service Limit: Up to 130 km/h (80 mph), 2 mm (0.08 in.) Over 130 km/h (80 mph), 3 mm (0.12 in.)]

Specifications

Item	Standard
Standard Tires:	
Make	IRC
Type:	
Front	RX-01F
Rear	RX-01R
Size:	
Front	110/70-17 M/C 54S
Rear	130/70-17 M/C 62S



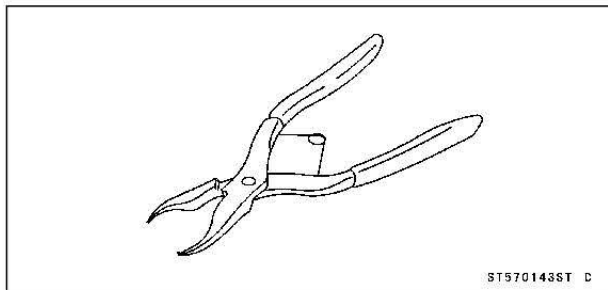
WARNING

Some replacement tires may adversely affect handling and cause an accident resulting in serious injury or death. To ensure proper handling and stability, use only the recommended standard tires for replacement, inflated to the standard pressure.

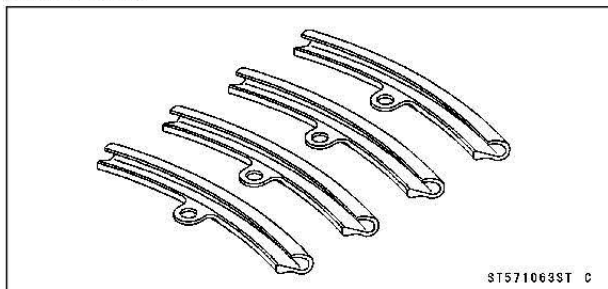
10-6 WHEELS/TIRES

Special Tools

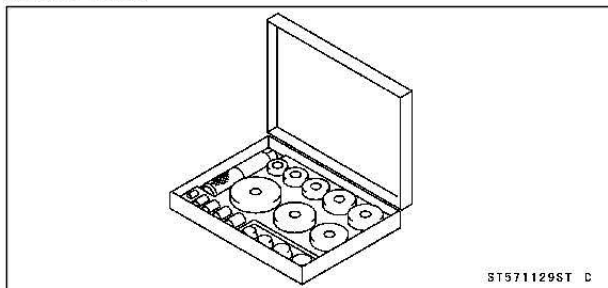
Inside Circlip Pliers:
57001-143



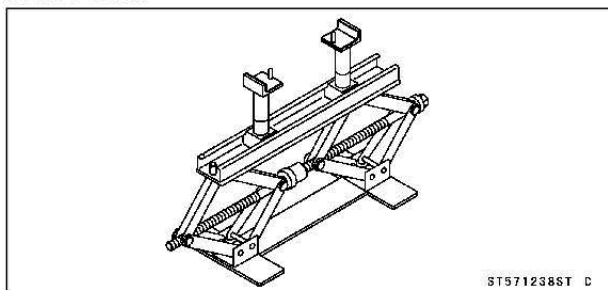
Rim Protector:
57001-1063



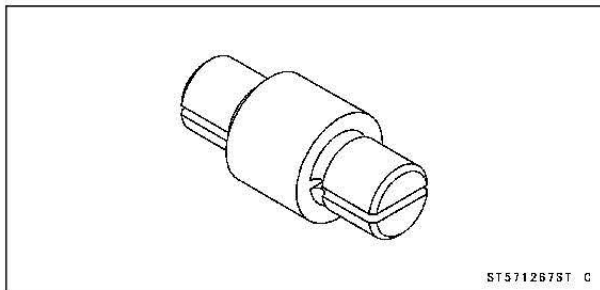
Bearing Driver Set:
57001-1129



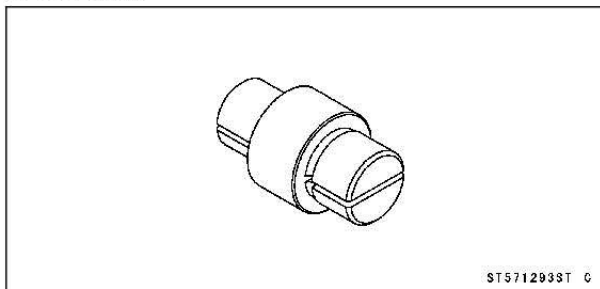
Jack:
57001-1238



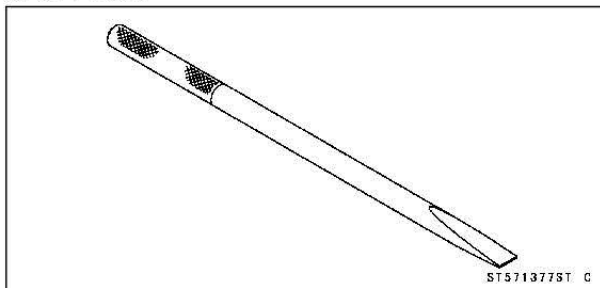
Bearing Remover Head, $\phi 15 \times \phi 17$:
57001-1267



Bearing Remover Head, $\phi 20 \times \phi 22$:
57001-1293



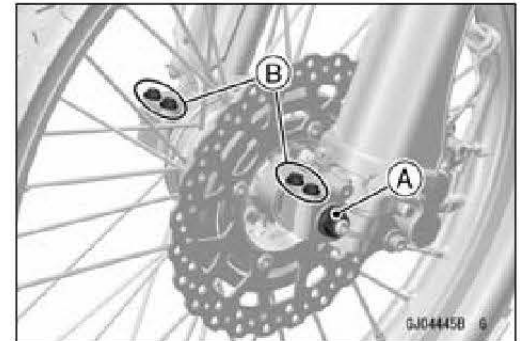
Bearing Remover Shaft, $\phi 13$:
57001-1377



Wheels (Rims)

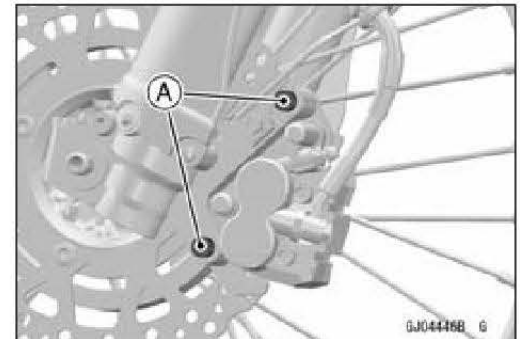
Front Wheel Removal

- Remove:
 - Front Axle Nut [A]
 - Front Axle Clamp Bolts [B]



- Remove the front caliper mounting bolts [A] to free the front caliper.
- Raise the front wheel off the ground with a suitable stand or jack.

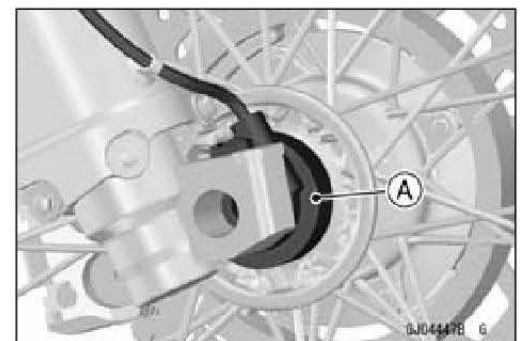
Special Tool - Jack: 57001-1238



- Pull out the axle and drop the front wheel.
- When removing the wheel, take care do not damage the speed sensor [A].

NOTICE

Do not lay the front wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.

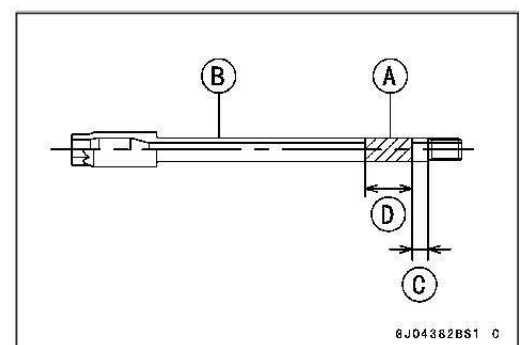


Front Wheel Installation

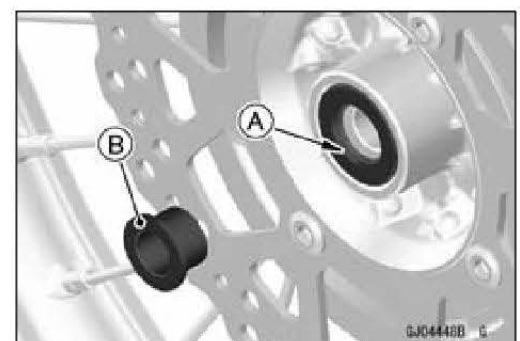
- Apply a thin coat of grease [A] to the front axle [B] for rust prevention.
 - About 10 mm (0.4 in.) [C]
 - About 30 mm (1.2 in.) [D]

NOTE

Do not apply grease to the threads of the axle.



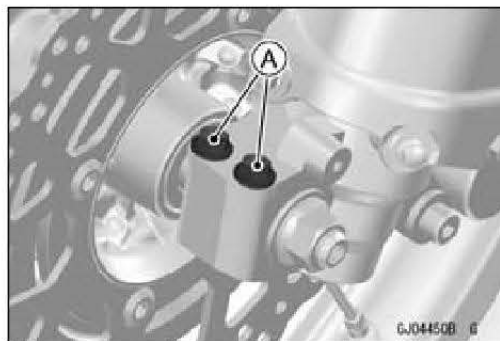
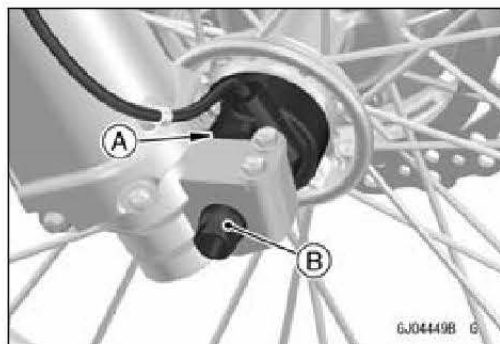
- Apply high-temperature grease to the grease seal lips [A] on both sides.
- Install the collar [B] on the left side of the hub.



10-8 WHEELS/TIRES

Wheels (Rims)

- Attach the speed sensor rotor to the right side (see [Speed Sensor Installation\(16-76\)](#)).
- Install the front wheel.
- Position the stopper [A] on the speed sensor to the upper side of the right fork leg as shown.
- Insert the front axle [B] from the right side.
- Wipe off excess grease.
- Install the front axle nut and front axle clamp bolts temporarily.
- Check that the wheel rotates smoothly.
- Remove the stand or jack.
- Tighten the left front axle clamp bolts [A] temporarily.
- Install the front caliper and the bolts temporarily.



- Pump the front fork up and down 4 or 5 times to all on the right front fork leg to seat on the front axle before tightening the front axle clamp bolts.

NOTE

○ Do not stop motorcycle moving forward with the front brake. Put a block [A] in front of the front wheel to stop moving.



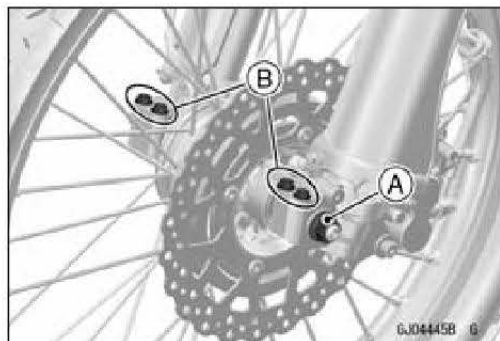
- Tighten:

Torque - Front Axle Nut [A]: 88 N·m (9.0 kgf·m, 65 ft·lb)

Front Axle Clamp Bolts [B]: 20 N·m (2.0 kgf·m, 15 ft·lb)

NOTE

○ Tighten the two clamp bolts alternately two times to ensure even tightening torque.



- Install the removed parts.
- Check the front brake effectiveness (see [Brake Operation Inspection\(2-42\)](#)).

WARNING

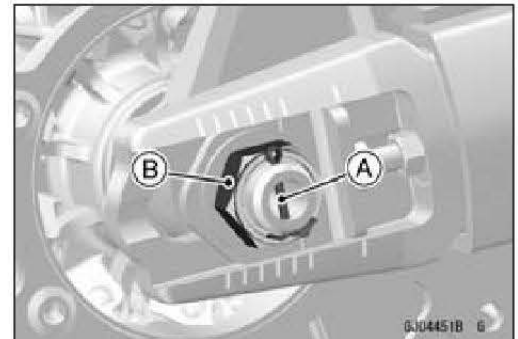
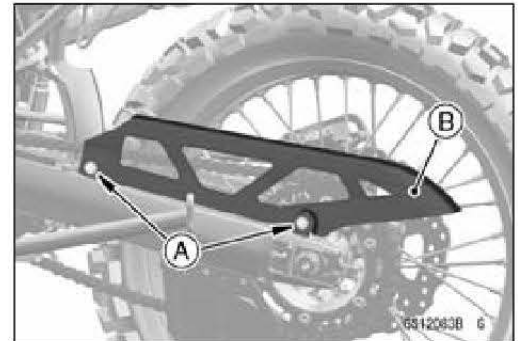
After servicing, it takes several applications of the brake lever before the brake pads contact the disc, which could result in increased stopping distance and cause an accident resulting in injury or death. Do not attempt to ride the motorcycle until a firm brake lever is obtained by pumping the lever until the pads are against the disc.

Wheels (Rims)

Rear Wheel Removal

- Remove:
 - Bolts [A]
 - Chain Cover [B]
- Remove:
 - Cotter Pin [A]
- Loosen:
 - Rear Axle Nut [B]
- Raise the rear wheel off the ground with a suitable stand or jack.

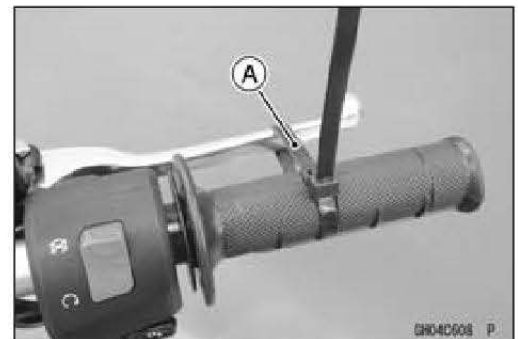
Special Tool - Jack: 57001-1238



- Squeeze the front brake lever, and hold it with a band [A] to prevent the motorcycle from running forward.

WARNING

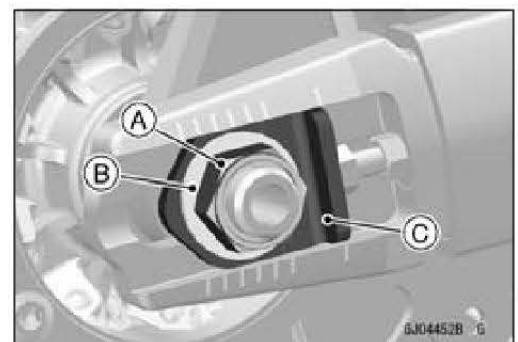
Motorcycle may fall over unexpectedly resulting in an accident or injury. Be sure to hold the front brake when removing the rear wheel.



- Remove:
 - Rear Axle Nut [A]
 - Washer [B]
 - Wheel Alignment Indicator [C]
- Pull out the rear axle and drop the rear wheel.
- Disengage the drive chain from the sprocket and remove the rear wheel.

NOTICE

Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place wooden blocks under the wheel so that the disc does not touch the ground.



10-10 WHEELS/TIRES

Wheels (Rims)

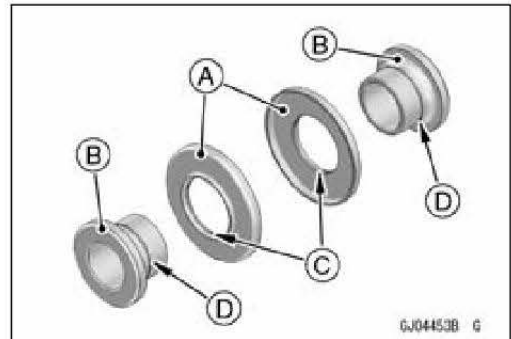
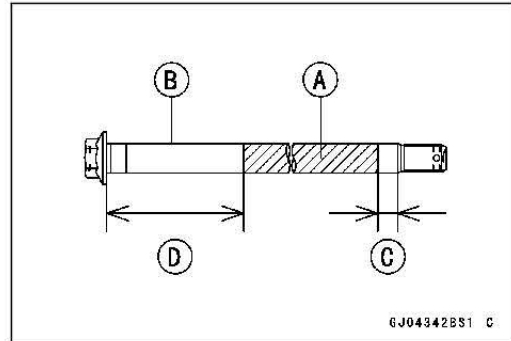
Rear Wheel Installation

- Replace the rear axle nut with a new one.
- Apply a thin coat of grease [A] to the rear axle [B] for rust prevention.
 - About 10 mm (0.4 in.) [C]
 - About 70 mm (2.8 in.) [D]

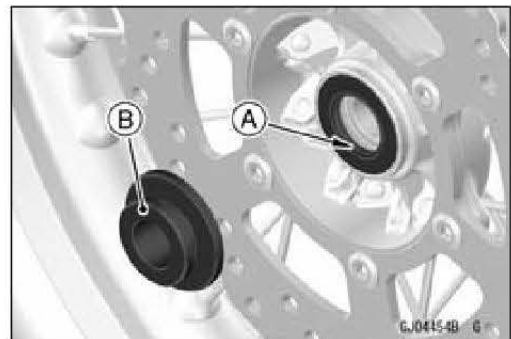
NOTE

○Do not apply grease to the threads of the axle.

- Assemble:
 - Caps [A]
 - Collars [B]
- Fit the projection [C] and the groove [D].



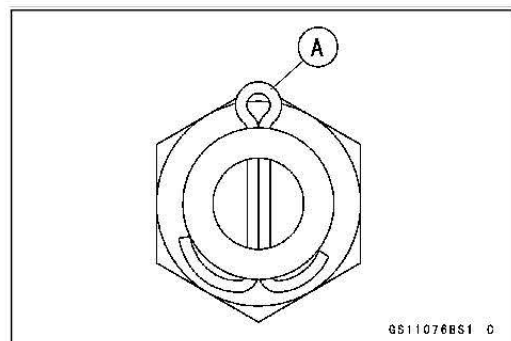
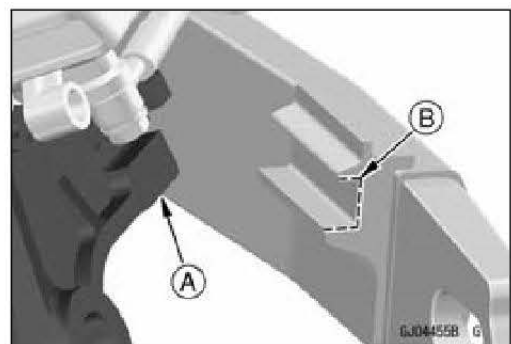
- Apply high-temperature grease to the grease seal lips [A] on both sides.
- Install the caps and collars on both sides.
- Place the "R" marked collar [B] to the right side.
- Engage the drive chain with the rear sprocket.



- Install the rear wheel.
- Position the rib [A] on the caliper bracket and the stopper rail [B].
- Insert the axle from the left side.
- Wipe off any excess grease.
- Install the rear axle nut temporarily.
- Adjust the drive chain slack ([see Drive Chain Slack Inspection\(2-38\)](#)).
- Tighten:

Torque - Rear Axle Nut: 110 N·m (11.2 kgf·m, 81.1 ft·lb)

- Insert a new cotter pin [A].
- Bend the cotter pin as shown.



⚠ WARNING

A loose axle nut can lead to an accident resulting in serious injury or death. Tighten the axle nut to the proper torque and install a new cotter pin.

Wheels (Rims)

- Check the rear brake effectiveness (see Brake Operation Inspection(2-42)).



WARNING

After servicing, it takes several applications of the brake pedal before the brake pads contact the disc, which could result in increased stopping distance and cause an accident resulting in injury or death. Do not attempt to ride the motorcycle until a firm brake pedal is obtained by pumping the pedal until the pads are against the disc.

Wheel Inspection

- Refer to the Wheel Bearing Damage Inspection (see Wheel Bearing Damage Inspection(2-37)).

Spoke Inspection

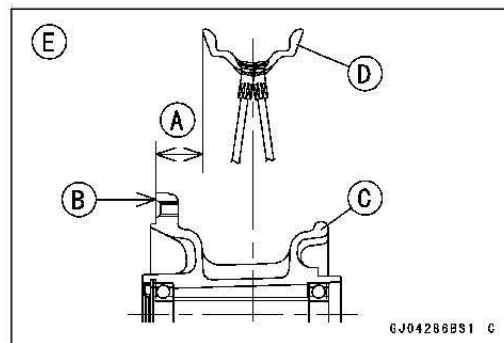
- Refer to the Spoke Tightness and Rim Runout Inspection (see Spoke Tightness and Rim Runout Inspection(2-37)).

Rim Inspection

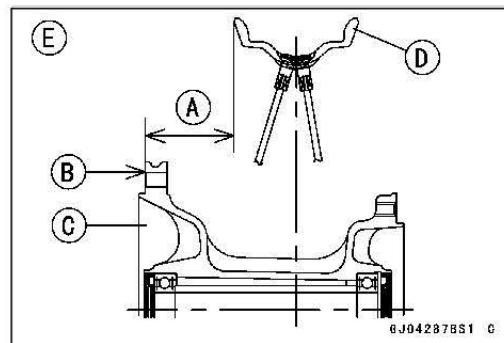
- Refer to the Spoke Tightness and Rim Runout Inspection (see Spoke Tightness and Rim Runout Inspection(2-37)).

Rim Installation Position Inspection

- When installing the rim, set the rim following position.
- The distance [A] from the brake disc seating surface [B] of the front hub [C] to left end of the front rim [D] should be as follows.
 - View from Rear [E]
 - Distance: 25.25 mm (0.99 in.) (KLX300D)
 - Distance: 5 mm (0.20 in.) (KLX300E)



- The distance [A] from the rear sprocket seating surface [B] of the rear hub [C] to left end of the rear rim [D] should be as follows.
 - View from Rear [E]
 - Distance: 51.1 mm (2.01 in.) (KLX300D)
 - Distance: 27.35 mm (1.08 in.) (KLX300E)



10-12 WHEELS/TIRES

Wheels (Rims)

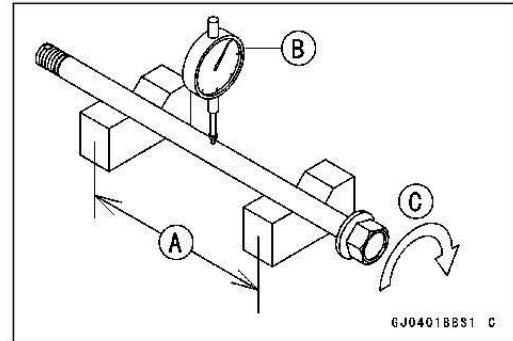
Axle Inspection

- Remove the axle (see [Front Wheel Removal\(10-7\)](#)) (see [Rear Wheel Removal\(10-9\)](#)).
- Visually inspect the front and rear axle for damages.
- ★ If the axle is damaged or bent, replace it.
- Place the axle on the V blocks that are 100 mm (3.94 in.) [A] apart, and set a dial gauge [B] on the axle at a point halfway between the blocks. Turn [C] the axle to measure the runout. The difference between the highest and lowest dial gauge reading is the amount of runout.
- ★ If the axle runout exceeds the service limit, replace the axle.

Axle Runout/100 mm (3.94 in.)

Standard: TIR 0.03 mm (0.001 in.) or less

Service Limit: TIR 0.2 mm (0.008 in.)



Tires

Air Pressure Inspection/Adjustment

- Refer to the Air Pressure Inspection (see Air Pressure Inspection(2-35)).

Tire Inspection

- Refer to the Wheels and Tires Inspection (see Wheels and Tires Inspection(2-36)).

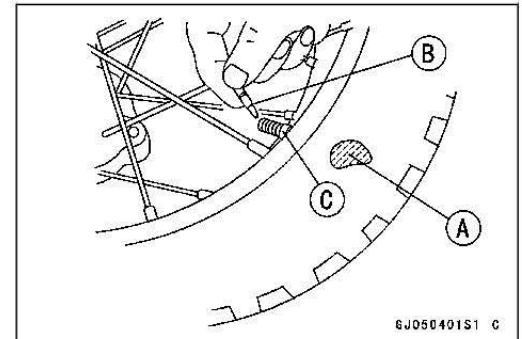
Tire Removal

- Remove:
Front Wheel (see Front Wheel Removal(10-7))
Rear Wheel (see Rear Wheel Removal(10-9))

NOTICE

Do not lay the front wheel on the ground with the disc facing down. This can damage or warp the disc. Place blocks under the wheel so that the disc does not touch the ground.

- To maintain wheel balance, mark the air valve position on the tire with chalk so that the tire can be reinstalled in the same position.
Chalk Mark or Yellow Mark [A]
Air Valve [B]
Align [C]



- Remove the air valve nut.
- Lubricate the tire beads and rim flanges on both sides with a soap and water solution or rubber lubricant. This helps the tire beads slip off the rim flanges.

NOTICE

Never lubricate with engine oil or petroleum distillates because they will deteriorate the tire.

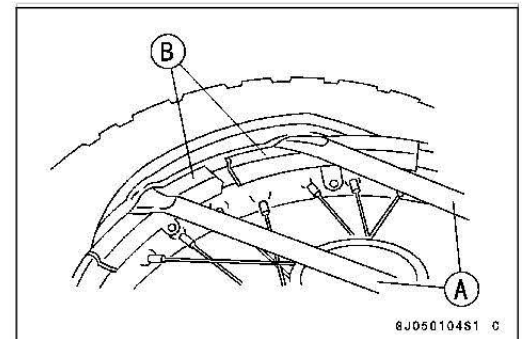
- Break the beads away from both sides of the rim with a commercially available bead breaker.
- Step on the side of the tire opposite air valve, and pry the tire off the rim with the tire iron [A] of the bead breaker protecting the rim with rim protectors [B].

Special Tools - Rim Protector: 57001-1063

NOTICE

Take care not to insert the tire irons so deeply that the tube gets damaged.

- Remove the tube when one side of the tire is pried off.
- Pry the tire off the rim.
- Remove the rim protector.



10-14 WHEELS/TIRES

Tires

Tire Installation

NOTE

○Replace the rim band with a new one whenever the tire is replaced.

- Inspect the rim and the tire before installing the tire, and replace them if necessary.
- Apply a soap and water solution or rubber lubricant to both the tire bead and the rim flange.

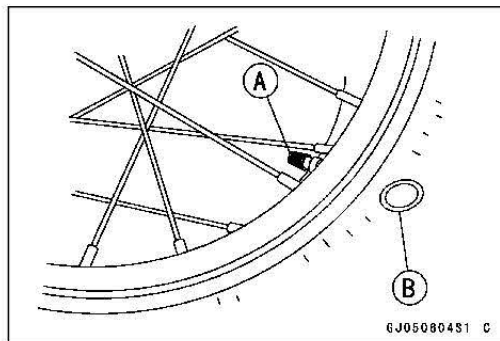
KLX300E

- Check the tire rotation mark [A] on the front and rear tires and install them on the rim accordingly.



○Position the tire on the rim so that the air valve [A] is at the tire balance mark [B] (the chalk mark made during removal, or the paint mark on a new tire).

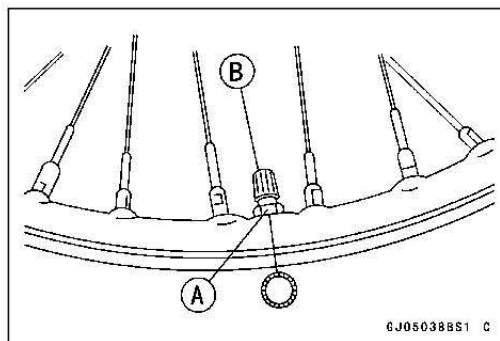
- Insert the valve stem into the rim, and screw the nut on loosely.
- Fit the rim protectors and use tire irons to install the tire bead.



NOTE

○To prevent rim damage, be sure to place the rim protectors at any place the tire irons are applied.

- Replace the tire back on the rim from the opposite side of the valve.
- Insert the tire irons so deeply that the tube is not damaged.
- Similarly, slip the tire bead back over the rim on the other side.
- Check that the tube is not pinched between the tire and rim.
- Tighten the valve stem nut [A], and put on the valve cap [B].
- Adjust the tire air pressure to the specified pressure (see Air Pressure Inspection(2-35)).



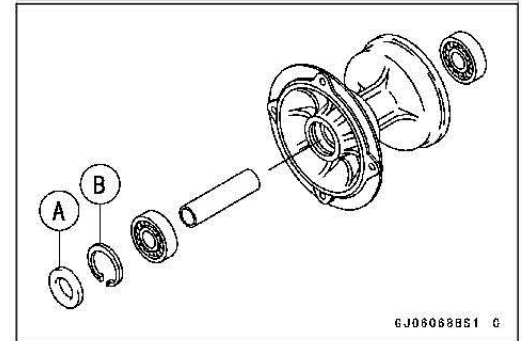
Hub Bearing

Hub Bearing Removal

Front

- Remove:
 - Front Wheel (see Front Wheel Removal(10-7))
 - Grease Seal [A]
 - Circlip [B]

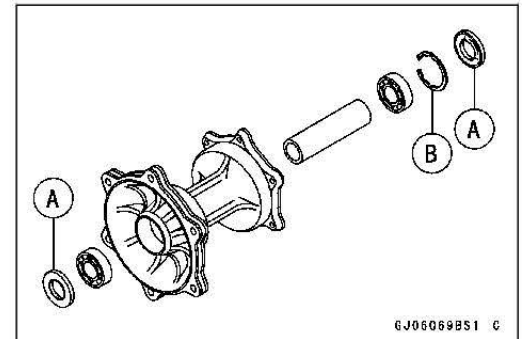
Special Tool - Inside Circlip Pliers: 57001-143



Rear

- Remove:
 - Rear Wheel (see Rear Wheel Removal(10-9))
 - Grease Seals [A]
 - Circlip [B]

Special Tool - Inside Circlip Pliers: 57001-143



- Remove the hub bearings [A] with the bearing remover.

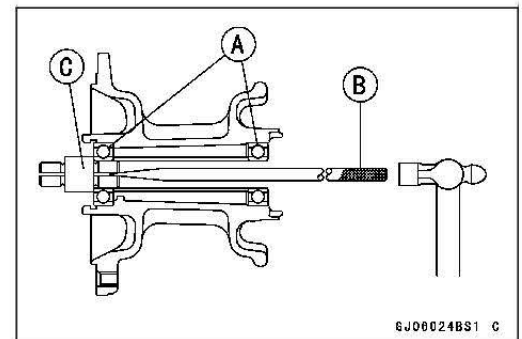
NOTICE

Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place wooden blocks under the wheel so that the disc does not touch the ground.

Special Tools - Bearing Remove Shaft, $\phi 13$: 57001-1377 [B]

Bearing Remover Head, $\phi 15 \times \phi 17$: 57001-1267 [C]

Bearing Remover Head, $\phi 20 \times \phi 22$: 57001-1293



Hub Bearing Installation

- Before installing the hub bearings, blow any dirt or foreign particles out of the hub with compressed air to prevent contamination of the bearings.
- Replace the bearings with new ones.

NOTE

○Install the bearings so that the marked side or sealed side faces out.

10-16 WHEELS/TIRES

Hub Bearing

Front

- First, press in the left side bearing [A] until it is bottomed.

Special Tool - Bearing Driver Set: 57001-1129

- Secondly, insert the collar [B] in the hub [C].
- Lastly, press in the right side bearing [D] until it is bottomed.

Special Tool - Bearing Driver Set: 57001-1129

Rear

- First, press in the right side bearing until it is bottomed.

Special Tool - Bearing Driver Set: 57001-1129

- Secondly, insert the collar in the hub.
- Lastly, press in the left side bearing until it is bottomed.

Special Tool - Bearing Driver Set: 57001-1129

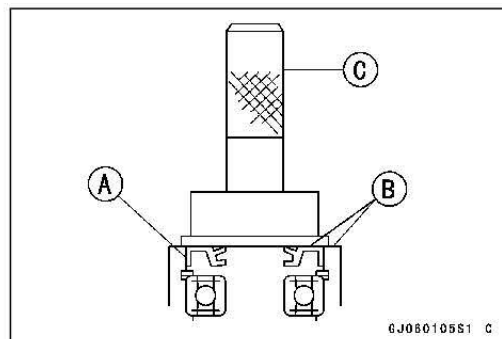
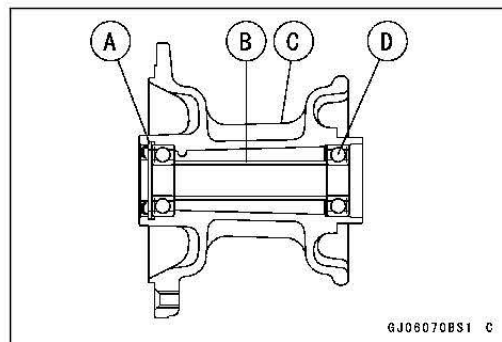
- Confirm that the axle can be inserted smoothly.
- Confirm that the each bearing inner race can be turned smoothly. Then visually inspect that the inner race of the opposite side turns.
- ★ If they do not turn smoothly, remove the bearings and collar and visually inspect the wheel and collar.
- Replace the circlips with new ones.

Special Tool - Inside Circlips Pliers: 57001-143

- Replace the grease seals with new ones.
- Press in the grease seal [A].
- Make the seal surface becomes flush [B] with the end of the hole.

Special Tool - Bearing Driver Set: 57001-1129 [C]

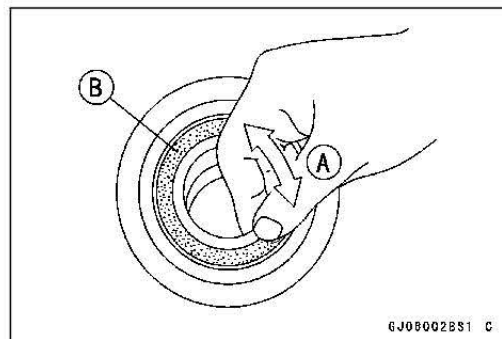
- Apply high-temperature grease to the grease seal lips.



Hub Bearing Inspection

NOTE

- Since the hub bearings are made to extremely close tolerances, the clearance can not normally be measured.
- Do not remove any bearings for inspection. If any bearings are removed, they will need to be replaced with new ones.
- Turn each bearing in the hub back and forth [A] while checking for plays, roughness, or binding.
- ★ If bearing play, roughness, or binding is found, replace the bearing.
- Examine the bearing seal [B] for tears or leakage.
- ★ If the seal is torn or is leaking, replace the bearing.



Hub Bearing

Hub Bearing Lubrication

NOTE

- *Since the hub bearings are packed with grease and sealed, lubrication is not required.*

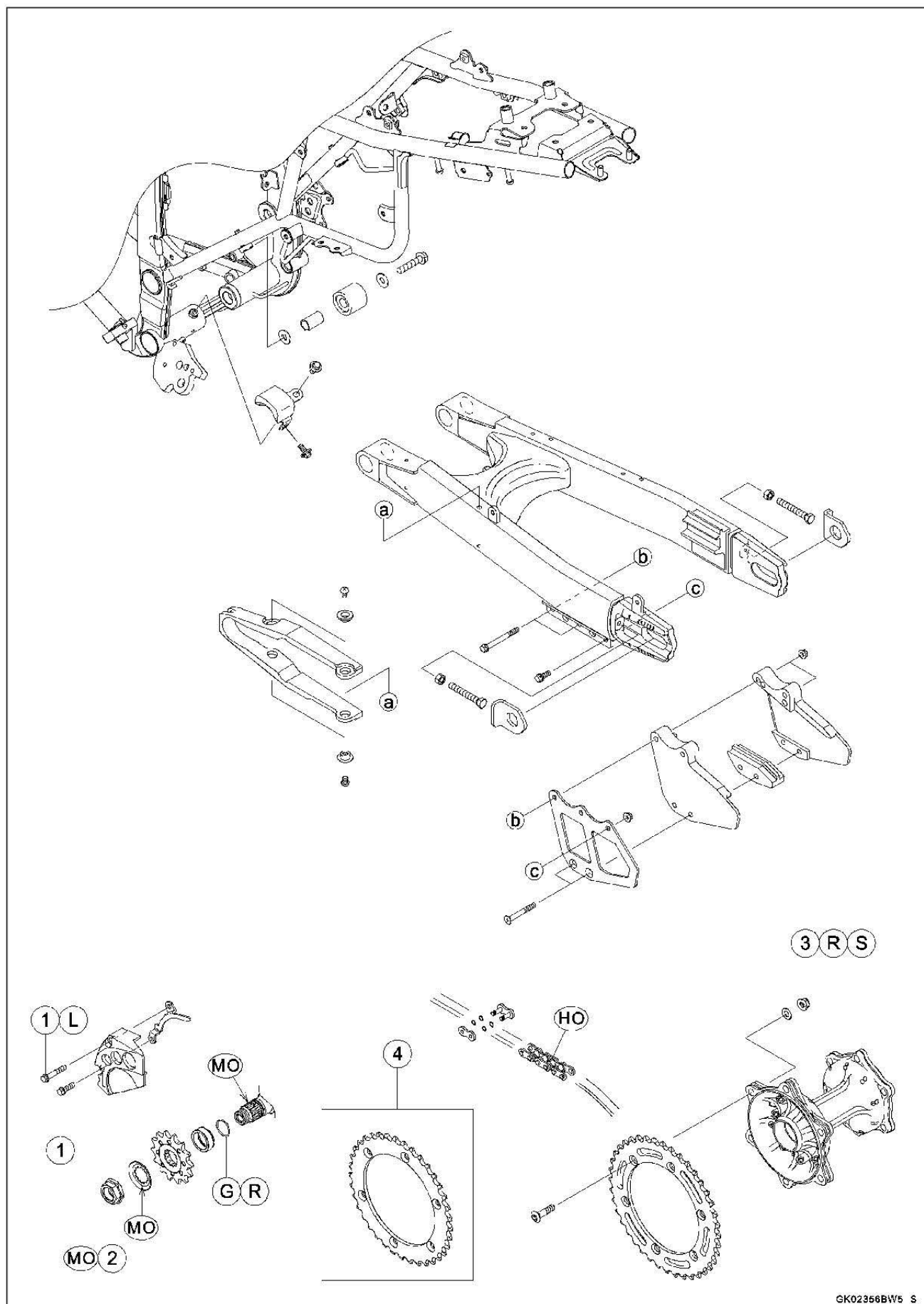
Final Drive

Table of Contents

Exploded View	11-2
Specifications	11-4
Special Tool	11-5
Drive Chain	11-6
Drive Chain Slack Inspection	11-6
Drive Chain Slack Adjustment	11-6
Wheel Alignment Inspection/Adjustment	11-6
Drive Chain Wear Inspection	11-6
Drive Chain Lubrication	11-6
Drive Chain Guide Wear Inspection	11-6
Drive Chain Removal	11-6
Drive Chain Installation	11-6
Drive Chain Replacement	11-6
Sprocket	11-10
Engine Sprocket Removal	11-10
Engine Sprocket Installation	11-10
Rear Sprocket Removal	11-11
Rear Sprocket Installation	11-11
Sprocket Wear Inspection	11-12
Rear Sprocket Warp Inspection	11-12

11-2 FINAL DRIVE

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Engine Sprocket Cover Bolts	9.8	1.0	87 in·lb	L (1)
2	Engine Sprocket Nut	129	13.2	95.2	MO
3	Rear Sprocket Nuts	34	3.5	25	R, S

4. KLX300E

G: Apply grease.

HO: Apply heavy oil.

L: Apply a non-permanent locking agent.

MO: Apply molybdenum disulfide oil solution.

(mixture of the engine oil and molybdenum disulfide grease in a weight ratio 10:1)

R: Replacement Parts

S: Follow the specified tightening sequence.

11-4 FINAL DRIVE

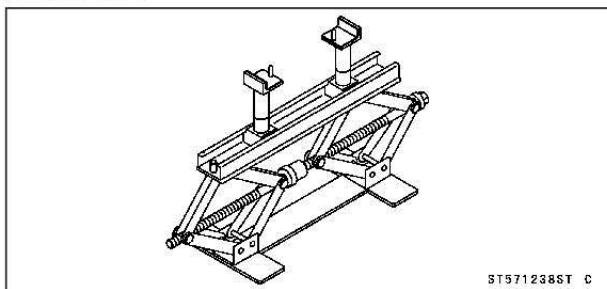
Specifications

Item	Standard
Drive Chain	
Drive Chain Slack	30 ~ 40 mm (1.2 ~ 1.6 in.)
Drive Chain Wear (20-link Length)	317.5 ~ 318.2 mm (12.50 ~ 12.53 in.) [Service Limit: 319 mm (12.6 in.)]
Standard Chain:	
Make	ENUMA
Type	EK520LVO3 (when shipping) EK520SRO2
Link (KLX300D)	106 links
Link (KLX300E)	104 links
Link Pin Outside Diameter (When drive chain replacing)	5.3 ~ 5.7 mm (0.21 ~ 0.22 in.)
Link Plates Outside width (When drive chain replacing)	17.35 ~ 17.50 mm (0.6831 ~ 0.6890 in.)
Sprockets	
Rear Sprocket Warp	TIR 0.4 mm (0.016 in.) or less [Service Limit: TIR 0.5 mm (0.02 in.)]

Special Tool

Jack:

57001-1238



11-6 FINAL DRIVE

Drive Chain

Drive Chain Slack Inspection

- Refer to the Drive Chain Slack Inspection ([see Drive Chain Slack Inspection\(2-38\)](#)).

Drive Chain Slack Adjustment

- Refer to the Drive Chain Slack Adjustment ([see Drive Chain Slack Adjustment\(2-39\)](#)).

Wheel Alignment Inspection/Adjustment

- Refer to the Wheel Alignment Inspection ([see Wheel Alignment Inspection\(2-39\)](#)).

Drive Chain Wear Inspection

- Refer to the Drive Chain Wear Inspection ([see Drive Chain Wear Inspection\(2-40\)](#)).

Drive Chain Lubrication

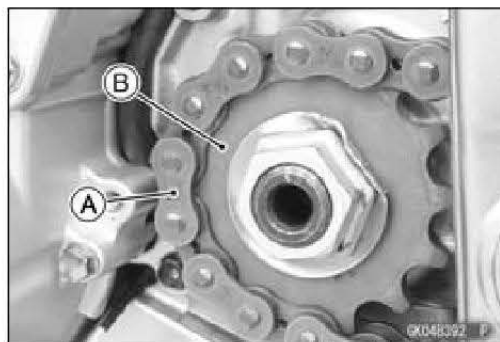
- Refer to the Drive Chain Lubrication Condition Inspection ([see Drive Chain Lubrication Condition Inspection\(2-40\)](#)).

Drive Chain Guide Wear Inspection

- Refer to the Chain Guide Wear Inspection ([see Chain Guide Wear Inspection\(2-41\)](#)).

Drive Chain Removal

- Remove:
 - Engine Sprocket ([see Engine Sprocket Removal\(11-10\)](#))
 - Swingarm ([see Swingarm Removal\(13-22\)](#))
- Remove the drive chain [A] from the engine sprocket [B], and take it off the chassis.



Drive Chain Installation

- Install the drive chain to the engine sprocket.
- Install the removed parts.
- Adjust the drive chain slack after installing the chain ([see Drive Chain Slack Adjustment\(2-39\)](#)).

Drive Chain Replacement

- Remove:
 - Engine Sprocket Cover ([see Engine Sprocket Removal\(11-10\)](#))

NOTICE

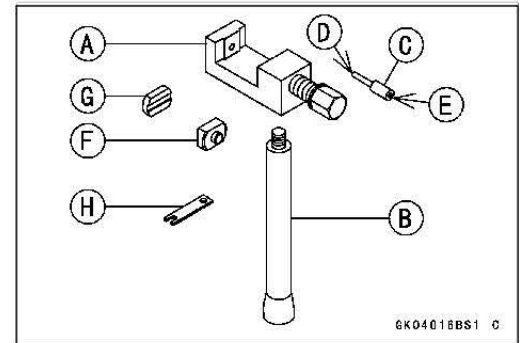
For safety, if the drive chain shall be replaced, replace it using a recommended tool.

Recommended Tool

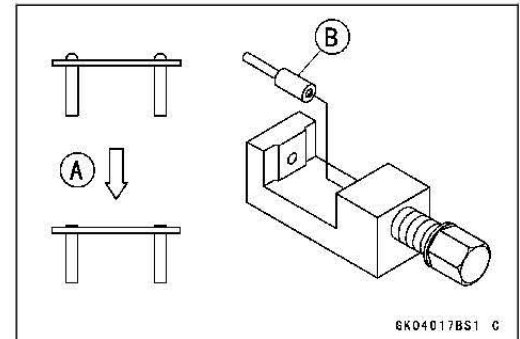
Type:	EK Joint Tool #50
Brand:	ENUMA

Drive Chain

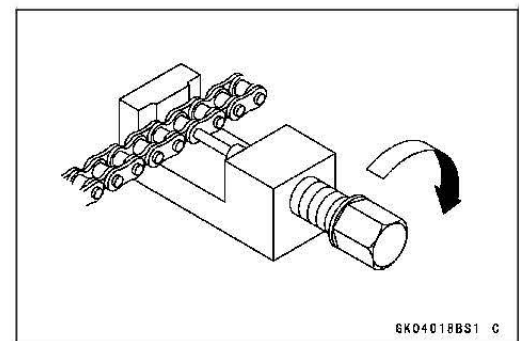
Body [A]
 Handlebar [B]
 Cutting and Riveting Pin [C]
 For Cutting [D]
 For Riveting [E]
 Plate Holder (A) [F]
 Plate Holder (B) [G]
 Gauge [H]



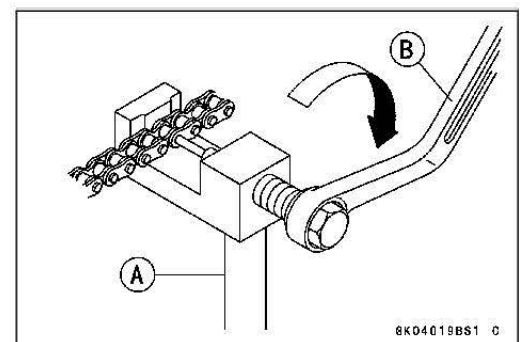
- Grind [A] the pin head to make it flat.
- Set the cutting and riveting pin [B] as shown.



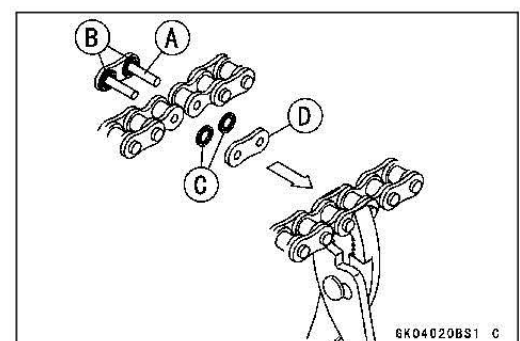
- Screw the pin holder until it touches the link pin.
- Be sure that the cutting pin hits center of the link pin.



- Screw the handlebar [A] into the body.
- Turn the pin holder with the wrench [B] clockwise to extract the link pin.



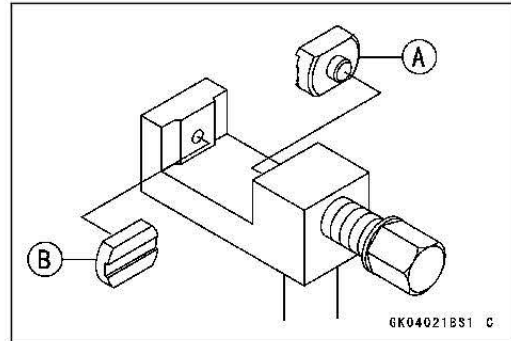
- Replace the link pin, link plate and grease seals.
- Apply grease to the link pins [A] and grease seals [B] [C].
- Engage the drive chain on the engine and rear sprockets.
- Insert the link pins in the drive chain ends.
- Install the grease seals.
- Install the link plate so that the mark [D] faces out.
- Push the link plate by hand or plier to fix it.
- Be sure to set the grease seals correctly.



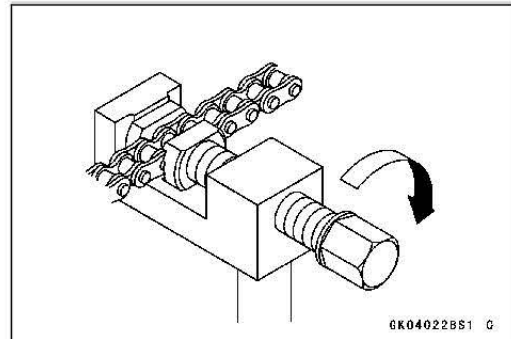
11-8 FINAL DRIVE

Drive Chain

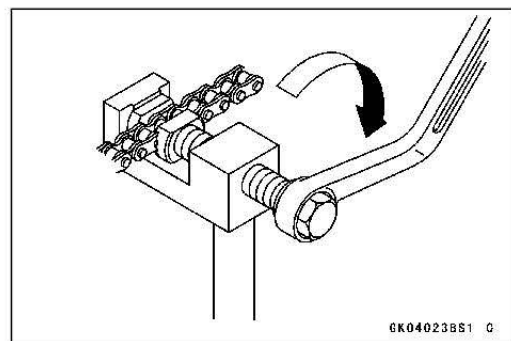
- Set the plate holder (A) [A] and plate holder (B) [B] on the body.



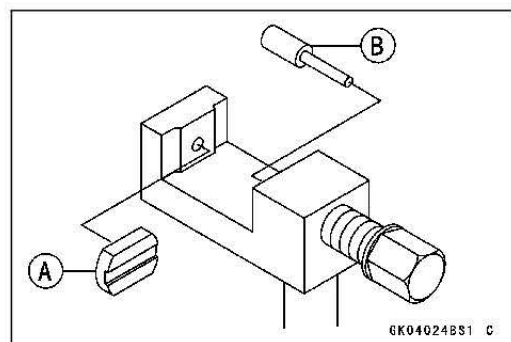
- Fit the plate holder (A) to the link plate.
- Turn the pin holder by hand until the plate holder (B) touches the other link plate.



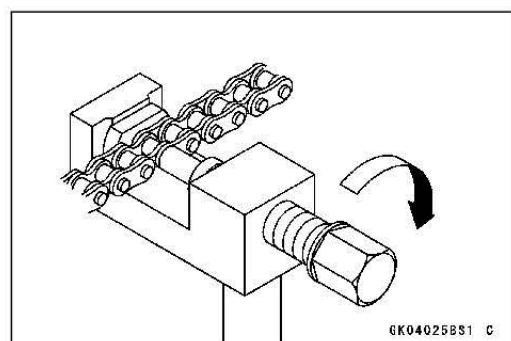
- Turn the pin holder by a wrench clockwise until two pins of link come into groove of the plate holder (A).
- Take off the plate holder.



- Set the plate holder (B) [A] and cutting and riveting pin [B] as shown.

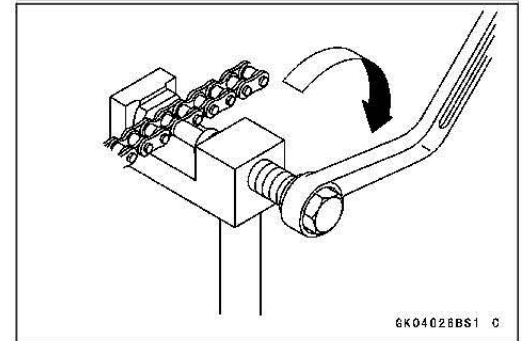


- Turn the pin holder until the riveting pin touches the link pin.



Drive Chain

- Turn the wrench clockwise until the tip of riveting pin hits of the link pin.
- Rivet it.
- Same work for the other link pin.



- After staking, check the staked area of the link pin for cracks.
- Measure the outside diameter [A] of the link pin and link plates width [B].

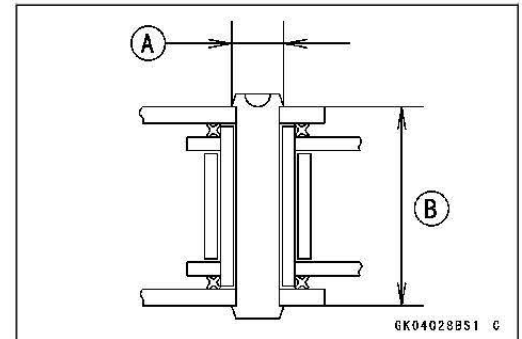
Link Pin Outside Diameter

Standard: 5.3 ~ 5.7 mm (0.21 ~ 0.22 in.)

Link Plates Outside Width

Standard: 17.35 ~ 17.50 mm (0.6831 ~ 0.6890 in.)

- ★ If the reading exceeds the specified length, cut and rejoin the chain again.
- Check the movement of the rollers.
- Adjust the drive chain slack after installing the chain ([see Drive Chain Slack Adjustment\(2-39\)](#)).
- Install the removed parts.

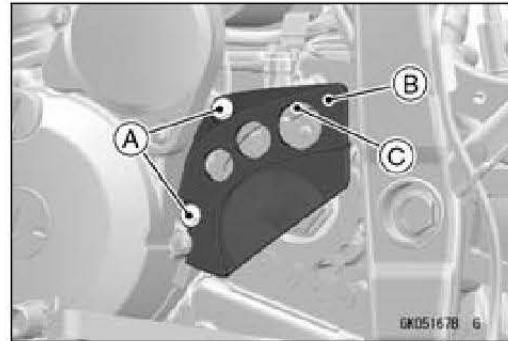


11-10 FINAL DRIVE

Sprocket

Engine Sprocket Removal

- Remove:
 - Engine Sprocket Cover Bolts [A]
 - Engine Sprocket Cover [B]
 - Chain Guide [C]

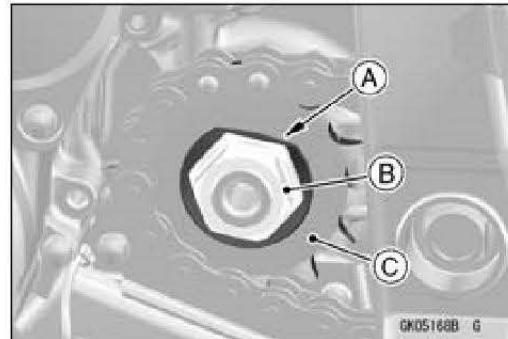


- Flatten out the bended washer [A].
- Remove:
 - Engine Sprocket Nut [B]
 - Washer

NOTE

○When loosening the engine sprocket nut, hold the rear brake on.

- Slack off the drive chain fully.
- Remove the engine sprocket [C].



Engine Sprocket Installation

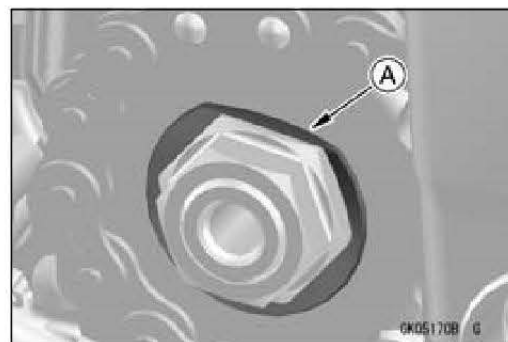
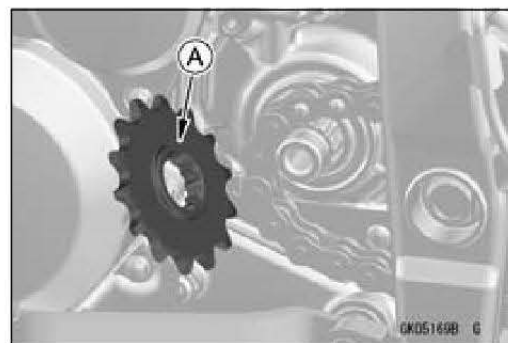
- Replace the washer with a new one.
- Install the engine sprocket.
- Place the stepped side [A] of the sprocket facing inward.
- Engage the drive chain.
- Apply molybdenum disulfide oil solution to the threads of the output shaft and seating surface of the engine sprocket nut.
- Tighten:

Torque - Engine Sprocket Nut: 129 N·m (13.2 kgf·m, 95.2 ft·lb)

NOTE

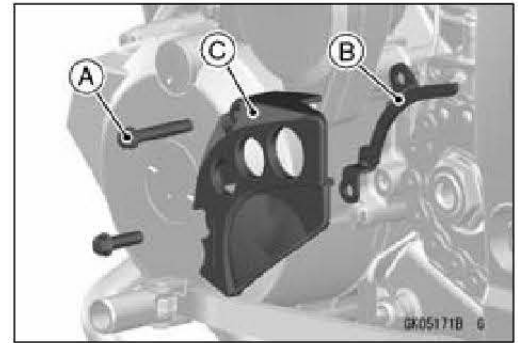
○Tighten the engine sprocket nut while applying the rear brake.

- After tightening the engine sprocket nut, bend [A] the one side of the washer over the nut.



Sprocket

- Apply a non-permanent locking agent to the engine sprocket cover bolt (upper) [A].
- Install:
 - Chain Guide [B]
 - Engine Sprocket Cover [C]
- Tighten:
 - Torque - Engine Sprocket Cover Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)**
- Adjust the drive chain slack ([see Drive Chain Slack Adjustment\(2-39\)](#)).



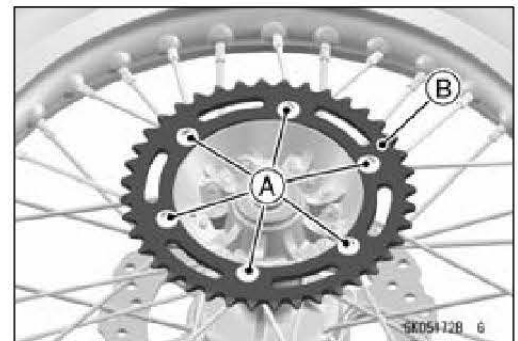
Rear Sprocket Removal

- Remove:
 - Rear Wheel ([see Rear Wheel Removal\(10-9\)](#))

NOTICE

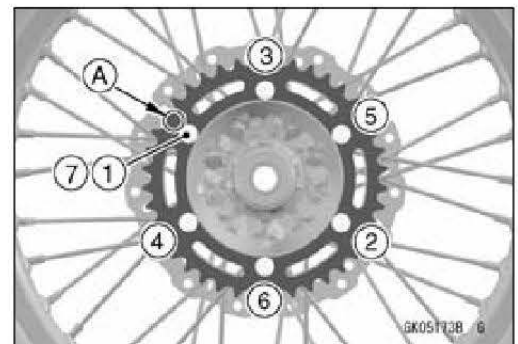
Do not lay the wheel on the ground with the disc facing down. This can damage or warp the disc. Place wooden blocks under the wheel so that the disc does not touch the ground.

- Remove:
 - Rear Sprocket Bolts [A] and Nuts
 - Rear Sprocket [B]



Rear Sprocket Installation

- Replace the rear sprocket nuts with new ones.
- Install the sprocket.
- Place the tooth number marking [A] facing outward.
- Tighten:
 - Torque - Rear Sprocket Nuts: 34 N·m (3.5 kgf·m, 25 ft·lb)**
- Follow the tightening sequence as specified in the figure.
- Install the rear wheel ([see Rear Wheel Installation\(10-10\)](#)).



11-12 FINAL DRIVE

Sprocket

Sprocket Wear Inspection

- Visually inspect the engine and rear sprocket teeth for wear and damage.
- ★ If the teeth are worn as illustrated, replace the sprocket, and inspect the drive chain wear (see Drive Chain Wear Inspection(2-40)).

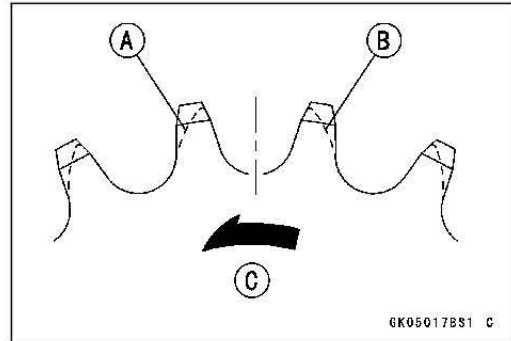
Worn Tooth (Engine Sprocket) [A]

Worn Tooth (Rear Sprocket) [B]

Direction of Rotation [C]

NOTE

○ If a sprocket requires replacement, the chain is probably worn also. When replacing a sprocket, inspect the chain.

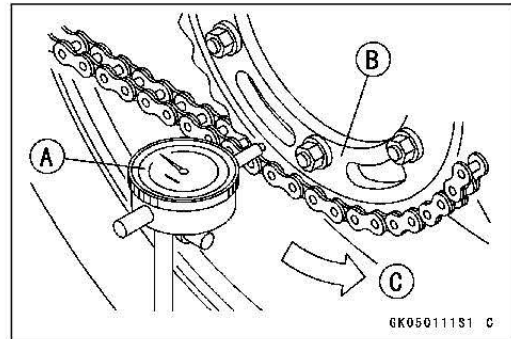


Rear Sprocket Warp Inspection

- Raise the rear wheel off the ground with jack so that it will turn freely.

Special Tool - Jack: 57001-1238

- Set a dial gauge [A] against the rear sprocket [B] near the teeth as shown, and rotate [C] the rear wheel to measure the sprocket runout (warp). The difference between the highest and lowest dial gauge readings is the amount of runout (warp).



Rear Sprocket Warp

Standard: 0.4 mm (0.016 in.) or less

Service Limit: 0.5 mm (0.02 in.)

- ★ If the runout exceeds the service limit, replace the rear sprocket.

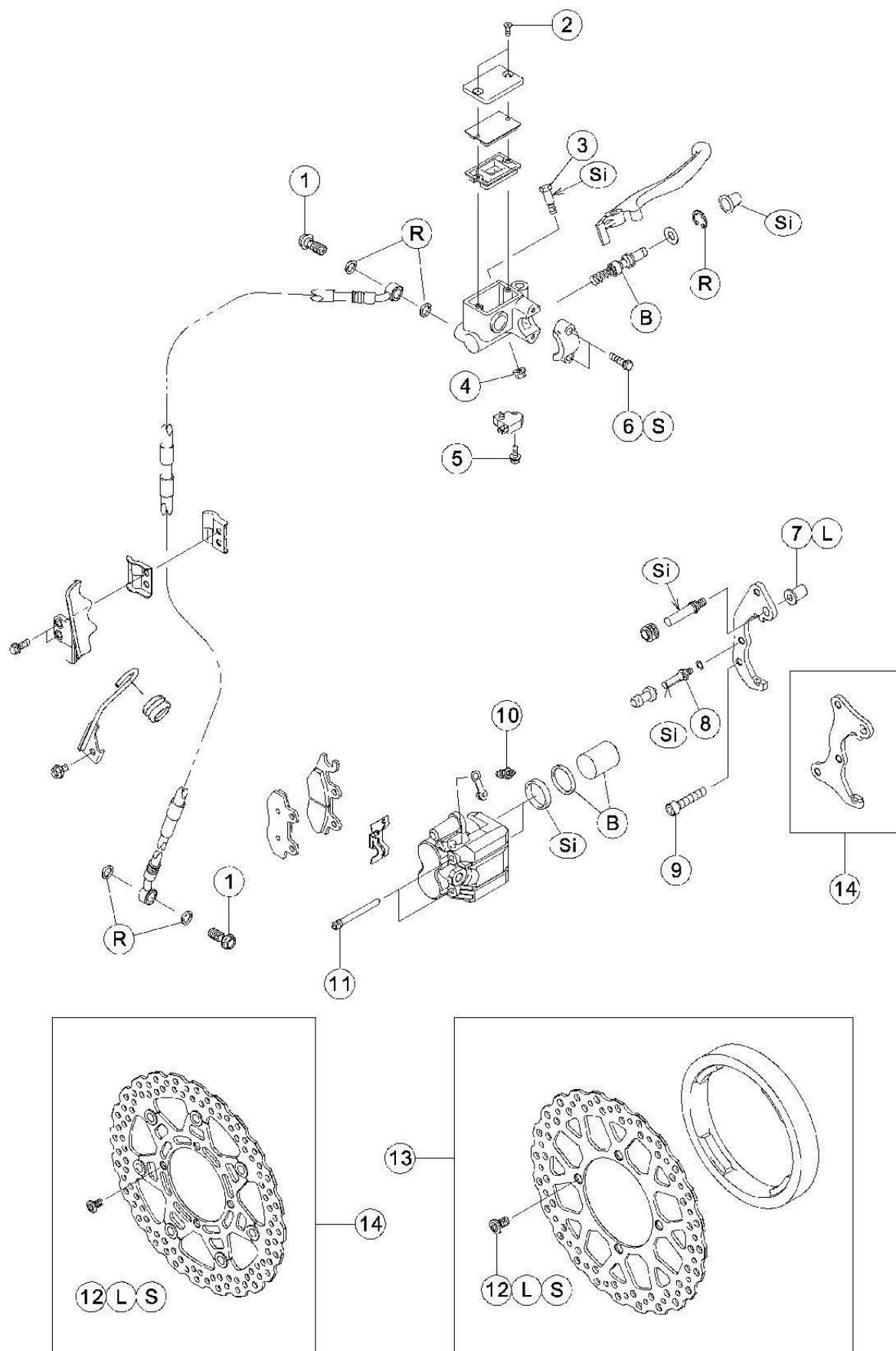
Brakes

Table of Contents

Exploded View.....	12-2
Specifications	12-6
Special Tool	12-7
Brake Pedal.....	12-8
Brake Pedal Position Adjustment.....	12-8
Brake Pedal Removal	12-8
Brake Pedal Installation	12-9
Calipers	12-10
Front Caliper Removal	12-10
Front Caliper Installation	12-10
Rear Caliper Removal.....	12-11
Rear Caliper Installation.....	12-11
Front Caliper Disassembly	12-12
Front Caliper Assembly.....	12-12
Rear Caliper Disassembly	12-12
Rear Caliper Assembly	12-12
Caliper Fluid Seal Damage Inspection.....	12-13
Caliper Dust Seal Damage Inspection	12-13
Caliper Dust Boot and Friction Boot Damage Inspection.....	12-14
Caliper Piston and Cylinder Damage Inspection	12-14
Caliper Holder Shaft/Pin Bolt Wear Inspection	12-15
Brake Pads	12-16
Front Brake Pad Removal.....	12-16
Front Brake Pad Installation.....	12-16
Rear Brake Pad Removal	12-16
Rear Brake Pad Installation	12-17
Brake Pad Wear Inspection	12-17
Master Cylinder	12-18
Front Master Cylinder Removal	12-18
Front Master Cylinder Installation	12-18
Rear Master Cylinder Removal.....	12-19
Rear Master Cylinder Installation.....	12-19
Master Cylinder Disassembly	12-20
Master Cylinder Assembly	12-20
Master Cylinder Inspection	12-20
Brake Disc	12-21
Brake Disc Removal	12-21
Brake Disc Installation	12-21
Brake Disc Wear Inspection.....	12-22
Brake Disc Warp Inspection.....	12-22
Brake Fluid	12-23
Brake Fluid Level Inspection.....	12-23
Brake Fluid Change	12-23
Brake Line Bleeding.....	12-23
Brake Hose.....	12-26
Brake Hose Removal/Installation.....	12-26
Brake Hose Inspection.....	12-26

12-2 BRAKES

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Brake Hose Banjo Bolts	25	2.5	18	
2	Brake Reservoir Cap Screws	1.5	0.15	13 in·lb	
3	Brake Lever Pivot Bolt	5.9	0.60	52 in·lb	Si
4	Brake Lever Pivot Locknut	5.9	0.60	52 in·lb	
5	Front Brake Light Switch Screw	1.2	0.12	11 in·lb	
6	Front Master Cylinder Clamp Bolts	8.8	0.90	78 in·lb	S
7	Front Caliper Holder Pin Nut	22	2.2	16	L
8	Front Caliper Holder Pin	17	1.7	13	Si
9	Front Caliper Mounting Bolts	25	2.5	18	
10	Caliper Bleed Valve	7.8	0.80	69 in·lb	
11	Front Brake Pad Pins	17	1.7	13	
12	Brake Disc Bolts	23	2.3	17	L, S

13. KLX300D

14. KLX300E

B: Apply brake fluid.

L: Apply a non-permanent locking agent.

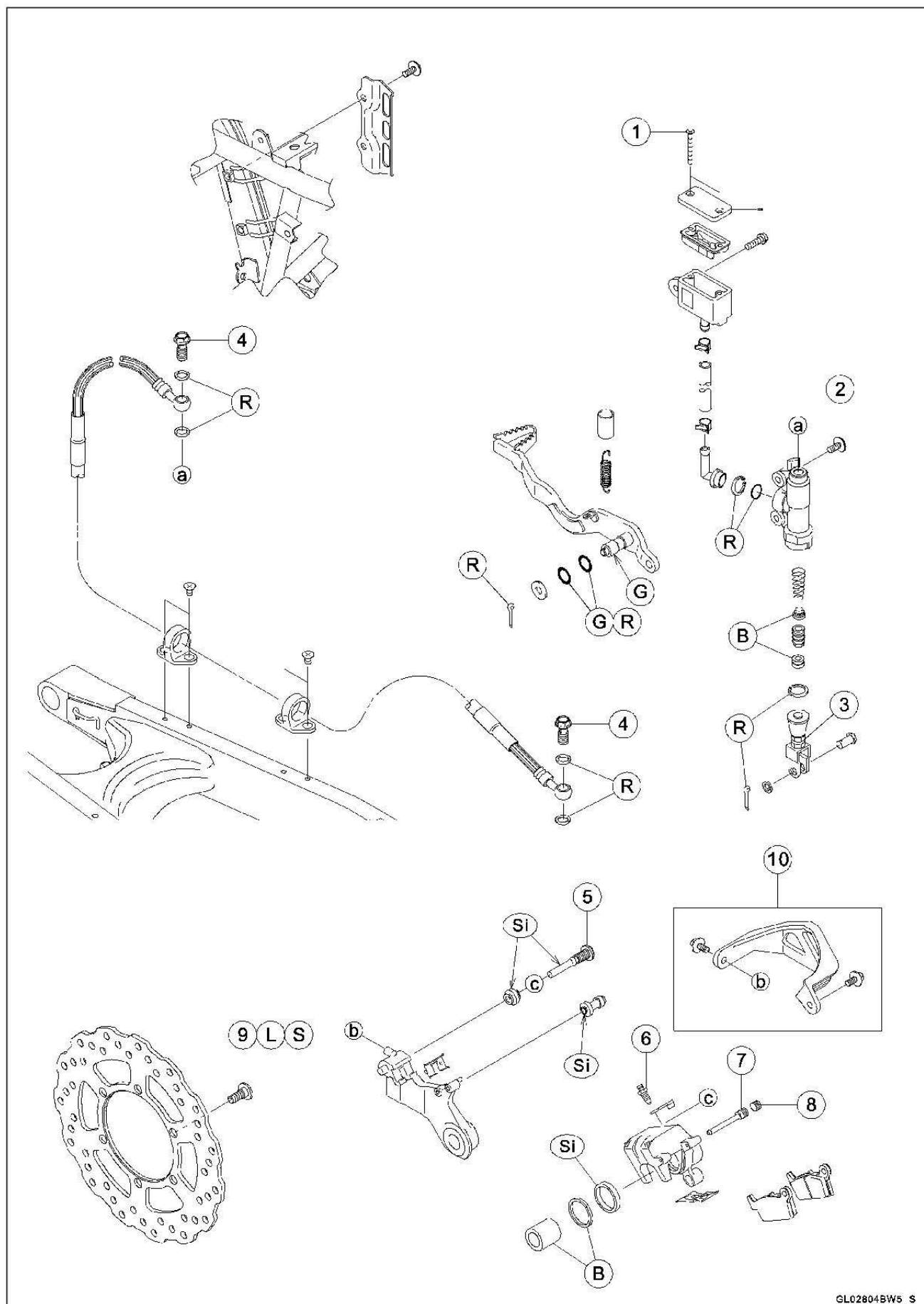
R: Replacement Parts

S: Follow the specified tightening sequence.

Si: Apply silicone grease.

12-4 BRAKES

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Brake Reservoir Cap Screws	1.5	0.15	13 in·lb	
2	Rear Master Cylinder Mounting Bolts	7.8	0.80	69 in·lb	
3	Rear Master Cylinder Push Rod Locknut	17	1.7	13	
4	Brake Hose Banjo Bolts	25	2.5	18	
5	Rear Caliper Mounting Bolt	27	2.8	20	Si
6	Caliper Bleed Valve	7.8	0.80	69 in·lb	
7	Rear Brake Pad Pin	17	1.7	13	
8	Rear Brake Pad Pin Plug	2.5	0.25	22 in·lb	
9	Brake Disc Bolts	23	2.3	17	L, S

10. KLX300D

B: Apply brake fluid.

G: Apply grease.

L: Apply a non-permanent locking agent.

R: Replacement Parts

S: Follow the specified tightening sequence.

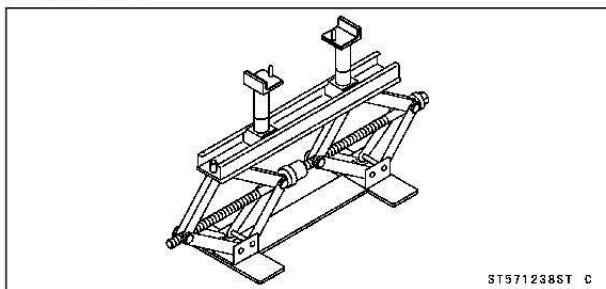
Si: Apply silicone grease.

12-6 BRAKES

Specifications

Item	Standard	Service Limit
Brake Lever, Brake Pedal		
Brake Lever Position	Non-adjustable	— — —
Brake Lever Free Play	Non-adjustable	— — —
Pedal Free Play	Non-adjustable	— — —
Pedal Position (KLX300D)	About 0.7 mm (0.03 in.) above top of footpeg	
Pedal Position (KLX300E)	About 13.4 mm (0.53 in.) below top of footpeg	— — —
Brake Pads		
Lining Thickness:		
Front	4.5 mm (0.18 in.)	1 mm (0.04 in.)
Rear	6.4 mm (0.25 in.)	1 mm (0.04 in.)
Brake Disc		
Thickness:		
Front (KLX300D)	3.4 ~ 3.7 mm (0.13 ~ 0.15 in.)	2.8 mm (0.11 in.)
Front (KLX300E)	3.8 ~ 4.2 mm (0.15 ~ 0.17 in.)	3.5 mm (0.14 in.)
Rear	4.3 ~ 4.7 mm (0.17 ~ 0.19 in.)	3.8 mm (0.15 in.)
Runout:		
Front	TIR 0.12 mm (0.0047 in.) or less	TIR 0.3 mm (0.01 in.)
Rear	TIR 0.12 mm (0.0047 in.) or less	TIR 0.3 mm (0.01 in.)
Brake Fluid		
Grade	DOT3 or DOT4	— — —

Special Tool

Jack:**57001-1238**

12-8 BRAKES

Brake Pedal

Brake Pedal Position Adjustment

NOTE

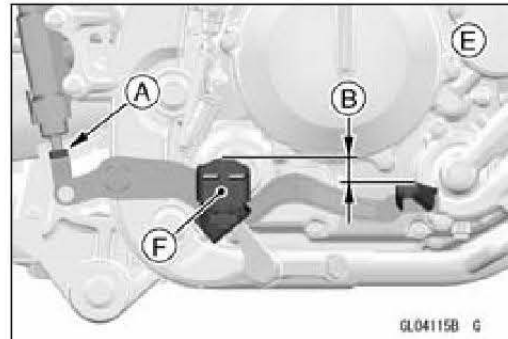
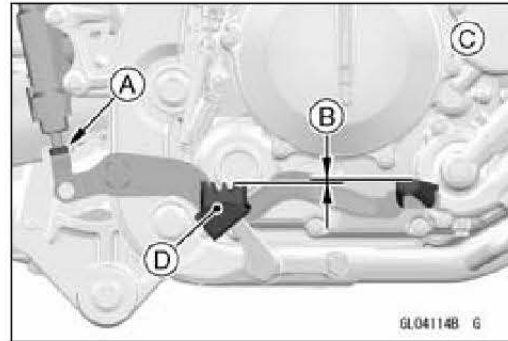
○ Usually it is not necessary to adjust the pedal position, but if the push rod locknut [A] is loose, always perform the adjustment.

Pedal Position [B]

Standard:

KLX300D [C] About 0.7 mm (0.03 in.) above top of footpeg [D]

KLX300E [E] About 13.4 mm (0.53 in.) below top of footpeg [F]



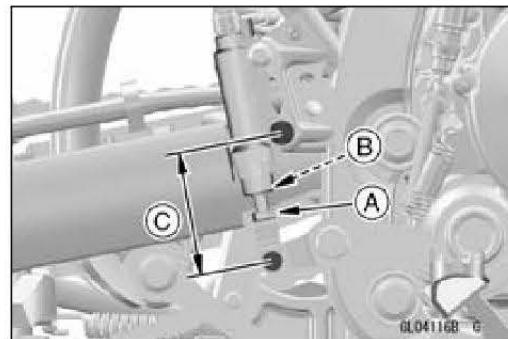
- Loosen the locknut [A] and turn the push rod with the hex head [B] to achieve the appropriate pedal position.

★ If the length [C] shown is 75 ± 1 mm (3.0 ± 0.04 in.), the pedal position will be within the standard range.

- Tighten:

Torque - Rear Master Cylinder Push Rod Locknut: 17 N·m (1.7 kgf·m, 13 ft·lb)

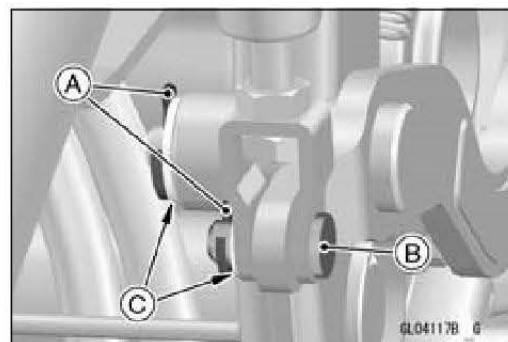
- Check the brake light switch operation (see Brake Light Switch Operation Inspection(2-51)).



Brake Pedal Removal

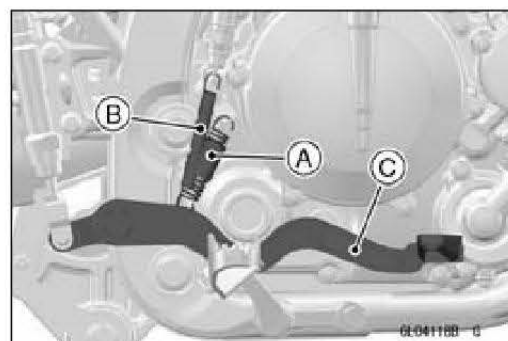
- Remove:

Cotter Pins [A]
Joint Pin [B]
Washers [C]



- Remove:

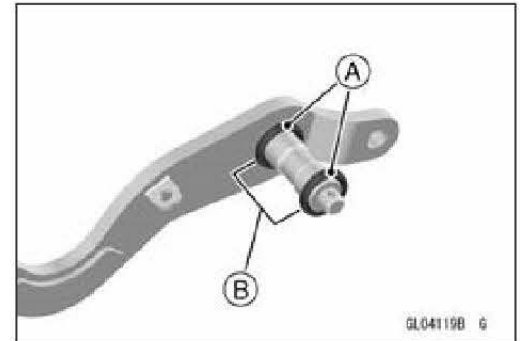
Brake Pedal Return Spring [A]
Brake Light Switch Spring [B]
Brake Pedal [C]



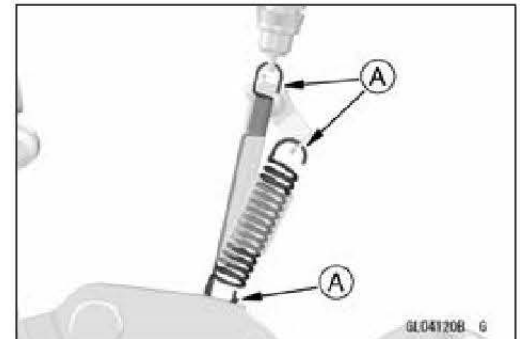
Brake Pedal

Brake Pedal Installation

- Replace:
 - O-rings [A]
 - Cotter Pins
- Apply grease to the O-rings and the pivot shaft [B] of the brake pedal.



- Install the removed parts.
- Place the spring ends [A] facing forward.
- Adjust the brake pedal position (see Brake Pedal Position Adjustment(12-8)).
- Check the brake light switch operation (see Brake Light Switch Operation Inspection(2-51)).

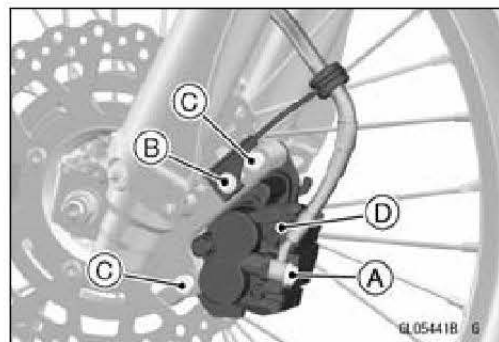


12-10 BRAKES

Calipers

Front Caliper Removal

- Loosen:
 - Brake Hose Banjo Bolt [A]
 - Bolt [B]
- Tighten the banjo bolt loosely to avoid spilling the brake fluid.
- Remove:
 - Front Caliper Mounting Bolts [C]
 - Brake Hose Banjo Bolt
 - Front Caliper [D]



NOTICE

Brake fluid quickly damages painted plastic surfaces; any spilled fluid should be completely washed away immediately.

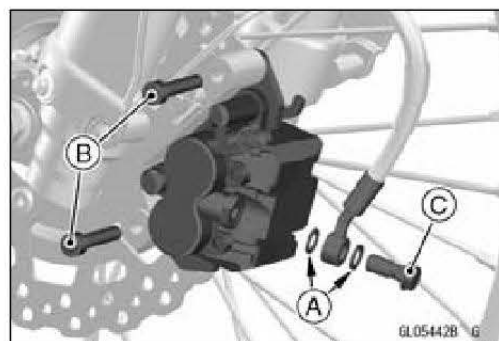
- Take care not to spill the brake fluid on the painted or plastic parts.
- Temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.
- Immediately wash away any brake fluid that spills.

Front Caliper Installation

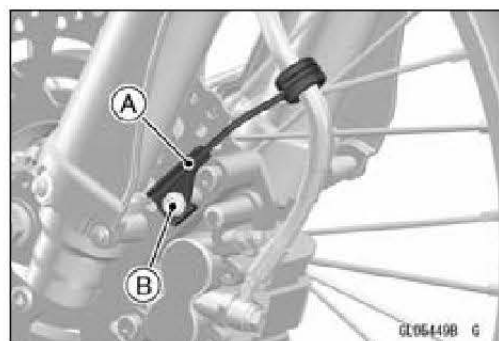
- Replace the washers [A] that are on each side of the hose fitting with new ones.
- Install the removed parts. Note the followings.
- Avoid sharp bending, kinking, flattening or twisting.
- Tighten:

Torque - Front Caliper Mounting Bolts [B]: 25 N·m (2.5 kgf·m, 18 ft·lb)

Brake Hose Banjo Bolt [C]: 25 N·m (2.5 kgf·m, 18 ft·lb)



- Hold the brake hose clamp [A] in place and tighten the bolt [B].
- Check the fluid level in the brake fluid reservoir ([see Brake Fluid Level Inspection\(2-42\)](#)).
- Bleed the brake line ([see Brake Line Bleeding\(12-23\)](#)).
- Check the brake for good braking power, no brake drag, and no fluid leakage.



⚠ WARNING

After servicing, it takes several applications of the brake lever before the brake pads contact the disc, which could result in increased stopping distance and cause an accident resulting in injury or death. Do not attempt to ride the motorcycle until a firm brake lever is obtained by pumping the lever until the pads are against the disc.

Calipers

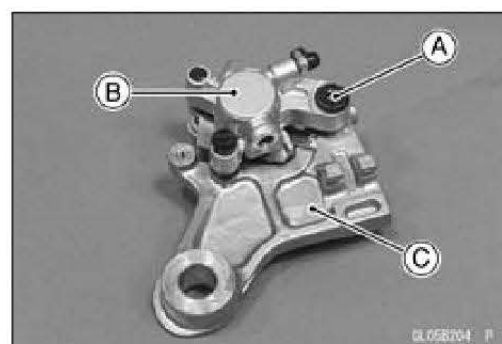
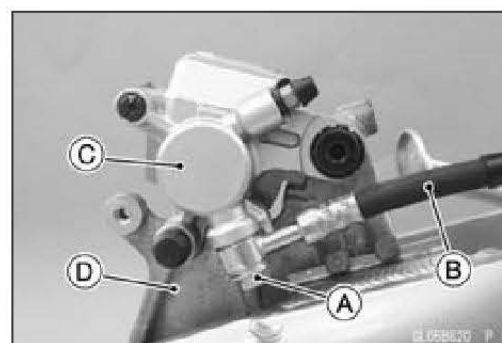
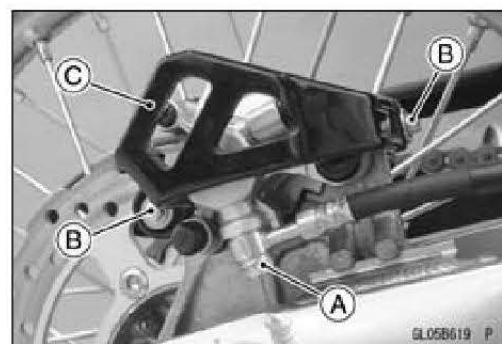
Rear Caliper Removal

- Loosen:
 - Brake Hose Banjo Bolt [A]
 - Tighten it loosely to avoid spilling the brake fluid.
- Remove:
 - Bolts (KLX300D) [B]
 - Guard (KLX300D) [C]
 - Rear Wheel (see [Rear Wheel Removal\(10-9\)](#))
- Unscrew the banjo bolt [A] and disconnect the brake hose [B] from the caliper.
- Remove the rear caliper [C] together with the caliper bracket [D].

NOTICE

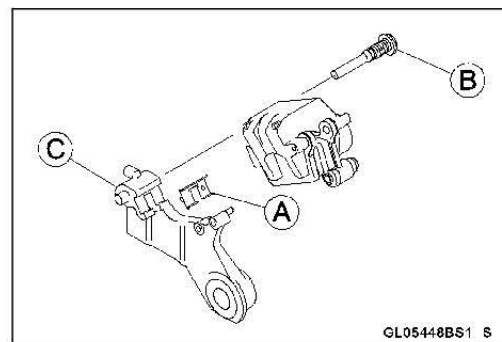
Brake fluid quickly damages painted plastic surfaces; any spilled fluid should be completely washed away immediately.

- Take care not to spill the brake fluid on the painted or plastic parts.
- Temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.
- Immediately wash away any brake fluid that spills.
- Remove the caliper mounting bolt [A] to separate the caliper [B] and caliper bracket [C].



Rear Caliper Installation

- Check that the stopper pad [A] is in place.
- Apply silicone grease to the rear caliper mounting bolt [B].
- Install the rear caliper to the caliper bracket [C].



12-12 BRAKES

Calipers

- Replace the washers that are on each side of the hose fitting with new ones.
- Install the removed parts.
- Tighten the brake hose banjo bolt loosely to avoid spilling the brake fluid.
- Touch the brake hose to the stopper of the caliper.
- Avoid sharp bending, kinking, flattening or twisting.

- Tighten:

Torque - Rear Caliper Mounting Bolt: 27 N·m (2.8 kgf·m, 20 ft·lb)

Brake Hose Banjo Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)

- Check the fluid level in the brake fluid reservoir (see Brake Fluid Level Inspection(2-42)).
- Bleed the brake line (see Brake Line Bleeding(12-23)).
- Check the brake for good braking power, no brake drag, and no fluid leakage.



WARNING

After servicing, it takes several applications of the brake pedal before the brake pads contact the disc, which could result in increased stopping distance and cause an accident resulting in injury or death. Do not attempt to ride the motorcycle until a firm brake pedal is obtained by pumping the pedal until the pads are against the disc.

Front Caliper Disassembly

- Refer to the Caliper Rubber Parts Replacement (see Caliper Rubber Parts Replacement(2-46)).

Front Caliper Assembly

- Refer to the Caliper Rubber Parts Replacement (see Caliper Rubber Parts Replacement(2-46)).

Rear Caliper Disassembly

- Refer to the Caliper Rubber Parts Replacement (see Caliper Rubber Parts Replacement(2-46)).

Rear Caliper Assembly

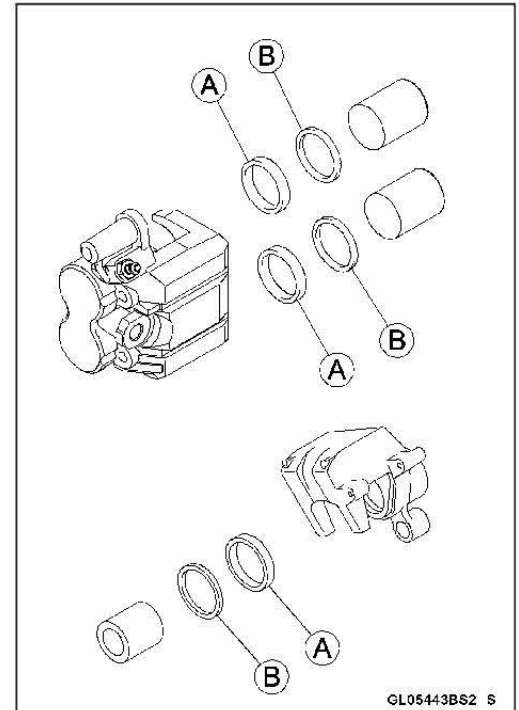
- Refer to the Caliper Rubber Parts Replacement (see Caliper Rubber Parts Replacement(2-46)).

Calipers

Caliper Fluid Seal Damage Inspection

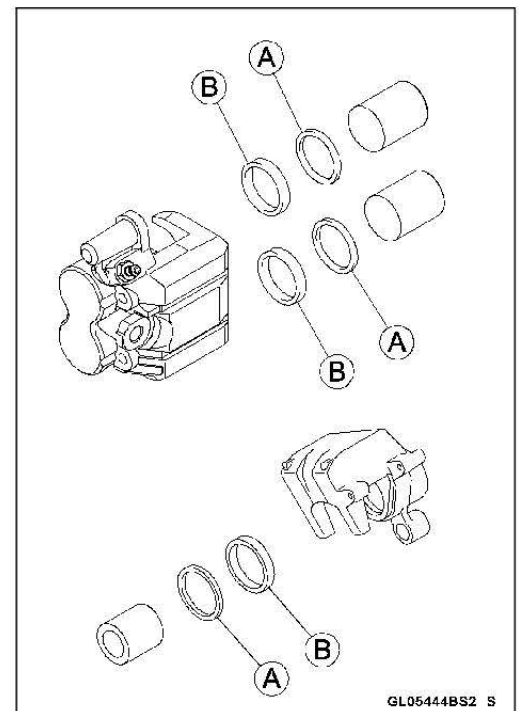
The fluid seals (piston seals) [A] are placed around the piston to maintain clearance between the pad and the disc. If the seal is in a poor condition, it could lead the pad to wear excessively or the brake to drag, which may cause the temperature of the discs or the brake fluid to increase.

- Replace the fluid seal if it exhibits any of the conditions listed below.
 - Brake fluid leakage around the pad.
 - Brakes overheat.
 - Considerable difference in inner and outer pad wear.
 - Seal and piston are stuck together.
- ★ If the fluid seal is replaced, replace the dust seal [B] as well. Also, replace all seals every other time the pads are changed.



Caliper Dust Seal Damage Inspection

- Check that the dust seals [A] are not cracked, worn, swollen or otherwise damaged.
 - ★ If they show any damage, replace the dust seals with new ones.
- Fluid Seals [B]

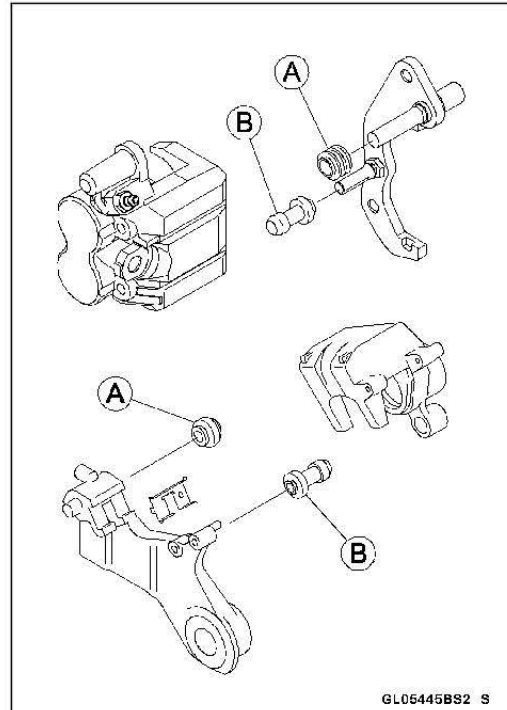


12-14 BRAKES

Calipers

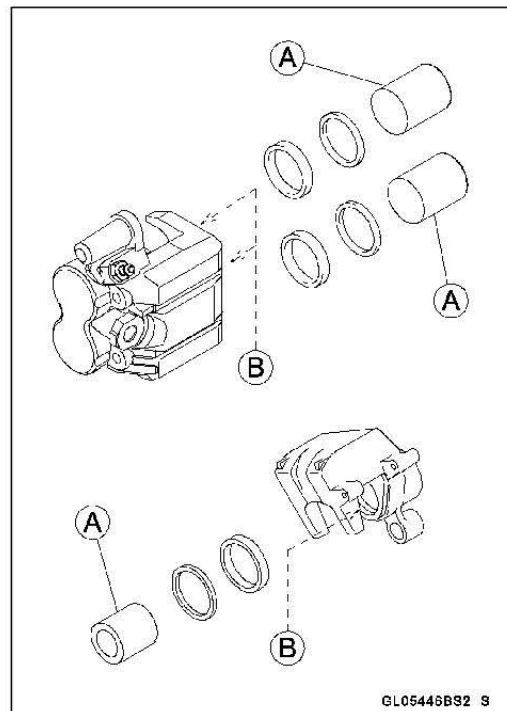
Caliper Dust Boot and Friction Boot Damage Inspection

- Check that the dust boot [A] and friction boot [B] are not cracked, worn, swollen, or otherwise damaged.
- ★ If they show any damage, replace it.



Caliper Piston and Cylinder Damage Inspection

- Visually inspect the pistons [A] and cylinder surfaces [B].
- ★ Replace the caliper if the cylinder and piston are badly scored or rusty.

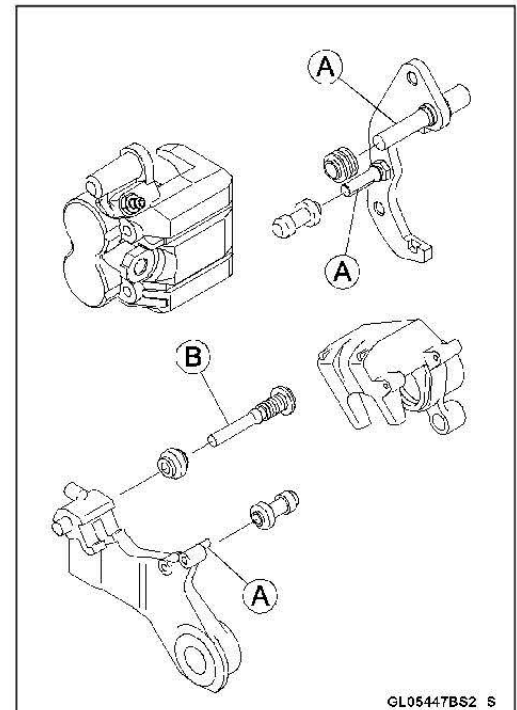


Calipers

Caliper Holder Shaft/Pin Bolt Wear Inspection

The caliper body must slide smoothly on the caliper holder shafts [A] and pin bolt [B]. If the caliper body does not slide smoothly, one pad will wear more than the other, pad wear will increase, and constant drag on the disc will raise brake and brake fluid temperature.

- Check to see that the caliper holder shafts and pin bolt are not badly worn or stepped, and that the dust boot and friction boot are not damaged.
- ★ If the boot is damaged, replace it.
- ★ If the caliper holder shaft or pin bolt is damaged, replace it.

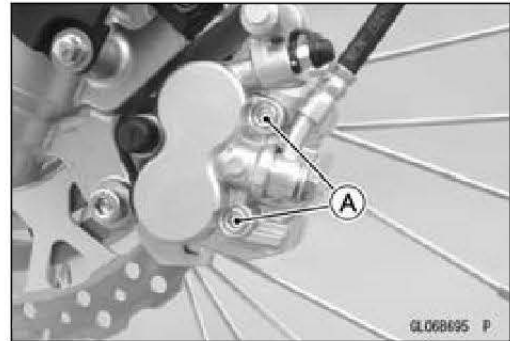


12-16 BRAKES

Brake Pads

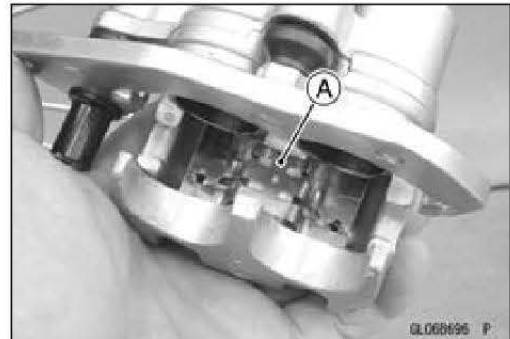
Front Brake Pad Removal

- Loosen the front brake pad pins [A].
- Remove the front caliper with the brake hose installed (see [Front Caliper Removal\(12-10\)](#)).
- Remove:
 - Front Brake Pad Pins
 - Front Brake Pads



Front Brake Pad Installation

- Check that the pad spring [A] is in place on the caliper.



- Push the caliper pistons in by hand as far as they will go.
- Install the brake pads on the pad spring correctly.
- Tighten the pad pins temporarily.
- Insert them while pushing the brake pads lightly.
- Install:
 - Front Caliper (see [Front Caliper Installation\(12-10\)](#))
- Tighten:

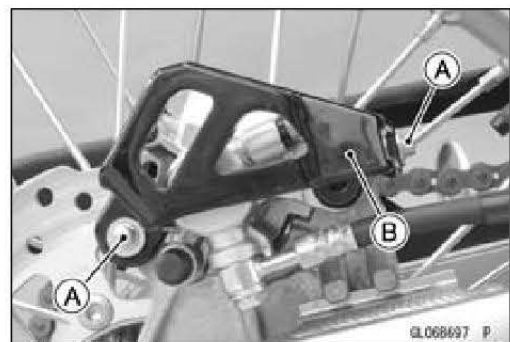
Torque - Front Brake Pad Pins: 17 N·m (1.7 kgf·m, 13 ft·lb)

WARNING

After servicing, it takes several applications of the brake lever before the brake pads contact the disc, which could result in increased stopping distance and cause an accident resulting in injury or death. Do not attempt to ride the motorcycle until a firm brake lever is obtained by pumping the lever until the pads are against the disc.

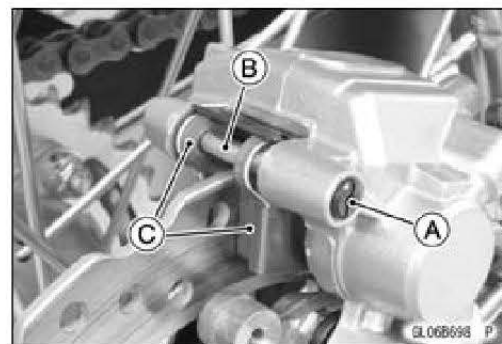
Rear Brake Pad Removal

- Remove:
 - Bolts [A] (KLX300D)
 - Guard [B] (KLX300D)



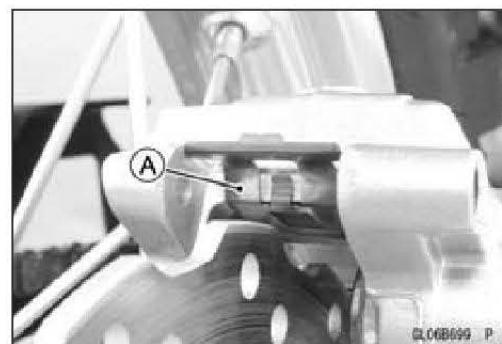
Brake Pads

- Remove:
 - Rear Brake Pad Pin Plug [A]
 - Rear Brake Pad Pin [B]
 - Rear Brake Pads [C]



Rear Brake Pad Installation

- Check that the pad spring [A] is in place on the caliper.



- Push the caliper piston in by hand as far as it will go.
- Install the brake pads on the pad spring correctly.
- Tighten the pad pin temporarily.
- Insert them while pushing the brake pads lightly.
- Tighten:
 - Torque - Rear Brake Pad Pin: 17 N·m (1.7 kgf·m, 13 ft·lb)
 - Rear Brake Pad Pin Plug: 2.5 N·m (0.25 kgf·m, 22 in·lb)

WARNING

After servicing, it takes several applications of the brake pedal before the brake pads contact the disc, which could result in increased stopping distance and cause an accident resulting in injury or death. Do not attempt to ride the motorcycle until a firm brake pedal is obtained by pumping the pedal until the pads are against the disc.

Brake Pad Wear Inspection

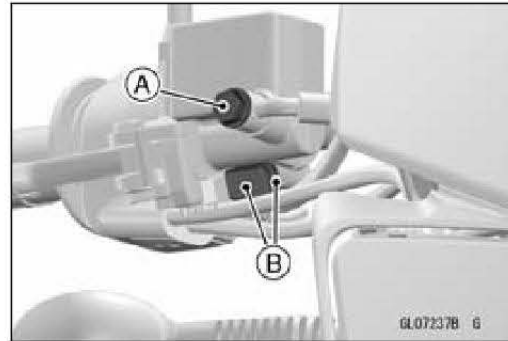
- Refer to the Brake Pad Wear Inspection (see Brake Pad Wear Inspection(2-50)).

12-18 BRAKES

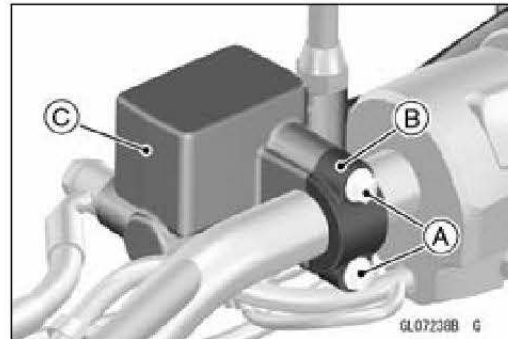
Master Cylinder

Front Master Cylinder Removal

- Loosen:
 - Brake Hose Banjo Bolt [A]
- Tighten it loosely to avoid spilling the brake fluid.
- Disconnect the front brake light switch connectors [B].



- Remove:
 - Front Master Cylinder Clamp Bolts [A]
 - Clamp [B]
 - Brake Hose Banjo Bolt
 - Front Master Cylinder [C]



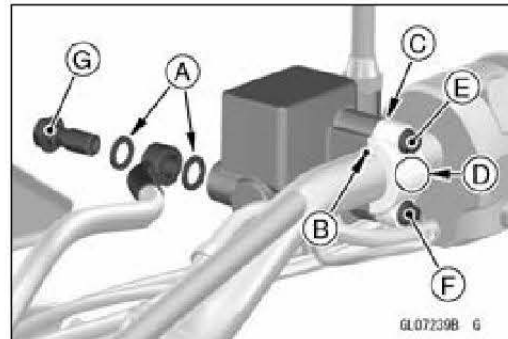
NOTICE

Brake fluid quickly damages painted plastic surfaces; any spilled fluid should be completely washed away immediately.

- Take care not to spill the brake fluid on the painted or plastic parts.
- Temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.
- Immediately wash away any brake fluid that spills.

Front Master Cylinder Installation

- Replace the washers [A] that are on each side of the hose fitting with new ones.
- Install the front master cylinder and the clamp.
- Align the punch mark [B] on the handlebars with the mating surface [C] of the master cylinder and clamp.
- The master cylinder clamp must be installed with the arrow mark [D] upward.
- Tighten the upper clamp bolt [E] first, and then the lower clamp bolt [F].
- There will be a gap at the lower part of the clamp after tightening.



Torque - Front Master Cylinder Clamp Bolts: 8.8 N·m (0.90 kgf·m, 78 in·lb)

- Install the brake hose.
- Tighten:

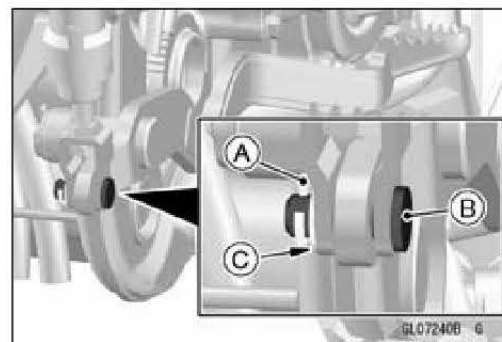
Torque - Brake Hose Banjo Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)

- Connect the front brake light switch connectors.
- Bleed the brake line (see Brake Line Bleeding(12-23)).
- Check the brake for good braking power, no brake drag, and no fluid leakage.

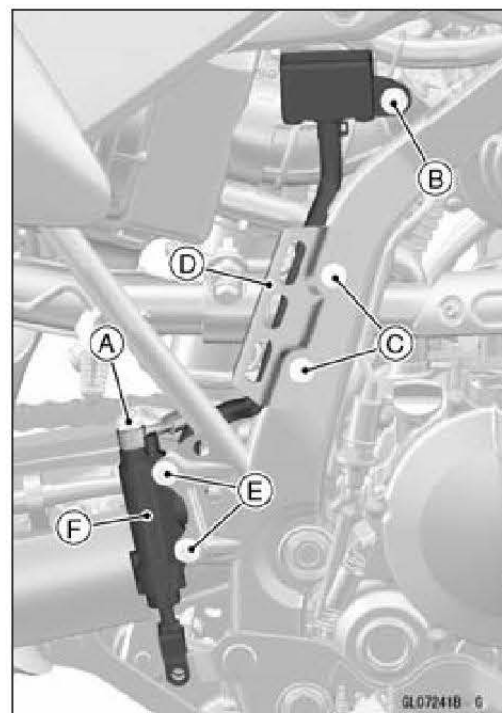
Master Cylinder

Rear Master Cylinder Removal

- Remove:
 - Cotter Pin [A]
 - Joint Pin [B]
 - Washer [C]



- Loosen:
 - Brake Hose Banjo Bolt [A]
- Tighten it loosely to avoid spilling the brake fluid.
- Remove:
 - Bolt [B]
 - Bolts [C]
 - Guard [D]
 - Rear Master Cylinder Mounting Bolts [E]
 - Rear Master Cylinder [F]



NOTICE

Brake fluid quickly damages painted plastic surfaces; any spilled fluid should be completely washed away immediately.

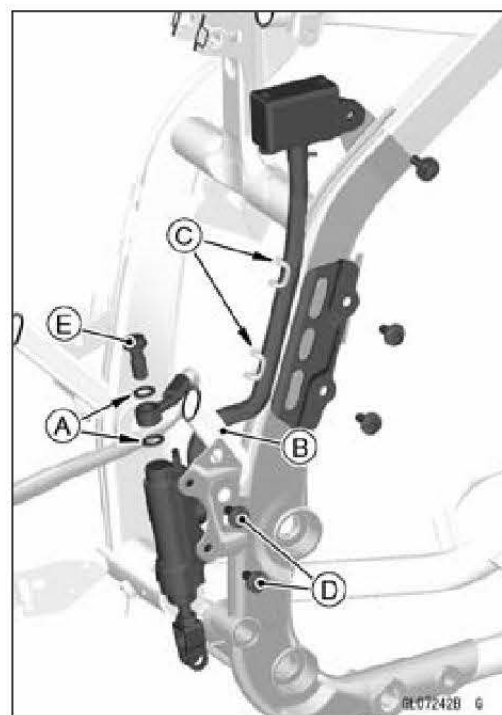
- Take care not to spill the brake fluid on the painted or plastic parts.
- Temporarily secure the end of the brake hose to some high place to keep fluid loss to a minimum.
- Immediately wash away any brake fluid that spills.

Rear Master Cylinder Installation

- Replace the washers [A] that are on each side of the hose fitting with new ones.
- Install the removed parts. Note the followings.
- Run the brake hose to the inside of the frame [B].
- Hold the brake hose with the guides [C].
- Tighten:

Torque - Rear Master Cylinder Mounting Bolts [D]: 7.8 N·m (0.80 kgf·m, 69 in·lb)

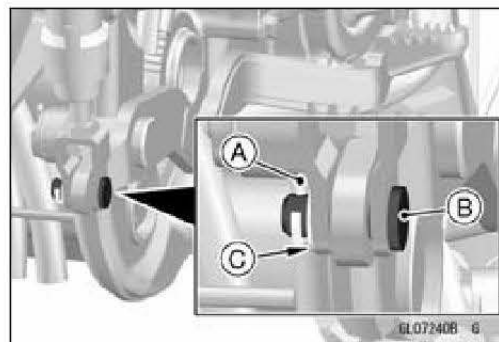
Brake Hose Banjo Bolts [E]: 25 N·m (2.5 kgf·m, 18 ft·lb)



12-20 BRAKES

Master Cylinder

- Replace the cotter pin [A] with a new one.
- Install:
 - Joint Pin [B]
 - Washer [C]
- Insert the cotter pin and bend the pin ends.
- Bleed the brake line (see Brake Line Bleeding(12-23)).
- Check the brake for good braking power, no brake drag, and no fluid leakage.



Master Cylinder Disassembly

- Refer to the Master Cylinder Rubber Parts Replacement (see Master Cylinder Rubber Parts Replacement(2-45)).

Master Cylinder Assembly

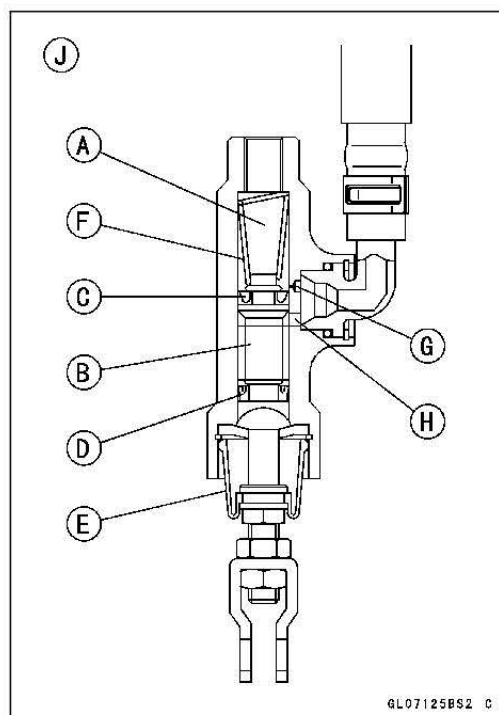
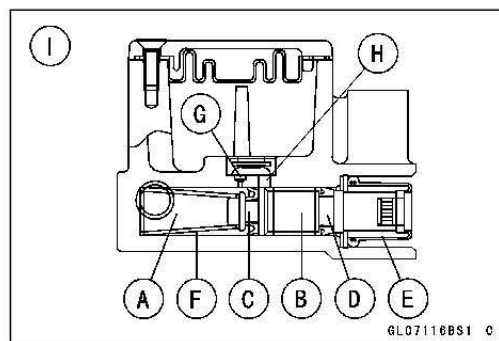
- Refer to the Master Cylinder Rubber Parts Replacement (see Master Cylinder Rubber Parts Replacement(2-45)).

Master Cylinder Inspection

- Remove the master cylinders (see Front Master Cylinder Removal(12-18)) (see Rear Master Cylinder Removal(12-19)).
- Disassemble the front and rear master cylinders (see Master Cylinder Rubber Parts Replacement(2-45)).
- Check that there are no scratches, rust or pitting on the inner wall [A] of each master cylinder and on the outside of each piston [B].
- ★ If a master cylinder or piston shows any damage, replace them.
- Inspect the primary cup [C] and secondary cup [D].
- ★ If a cup is worn, damaged softened (rotted), or swollen, the piston assembly should be replaced to renew the cups.
- ★ If fluid leakage is noted at the brake lever, the piston assembly should be replaced to renew the cups.
- Check the dust covers [E] for damage.
- ★ If they are damaged, replace them.
- Check the piston return springs [F] for any damage.
- ★ If the springs are damaged, replace them.
- Check that relief port [G] and supply port [H] are not plugged.
- ★ If the relief port becomes plugged, the brake pads will drag on the disc. Blow the ports clean with compressed air.

Front Master Cylinder [I]

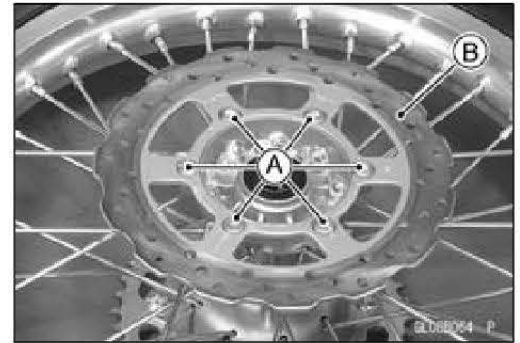
Rear Master Cylinder [J]



Brake Disc

Brake Disc Removal

- Remove:
 - Front Wheel (see Front Wheel Removal(10-7))
 - Rear Wheel (see Rear Wheel Removal(10-9))
 - Brake Disc Bolts [A]
 - Brake Disc [B]

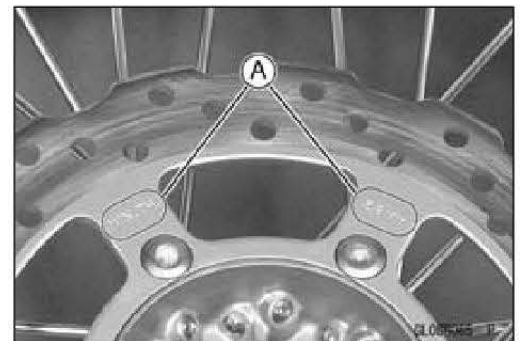


Brake Disc Installation

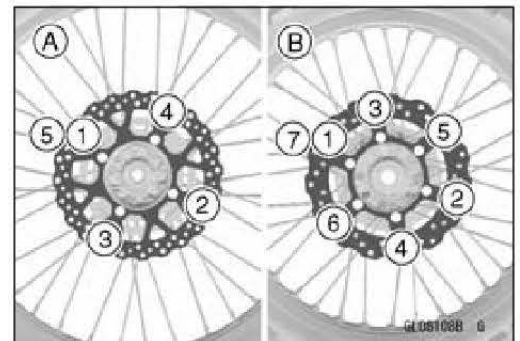
- (KLX300D) Check that the damper [A] for the front disc is in place.
- The damper has the installation direction. Touch the four ribs [B] on the damper to the front hub rim.



- Install the brake disc.
- Place the service limit marking [A] facing outward.



- Apply a non-permanent locking agent to the brake disc bolts.
- Tighten:
 - Torque - Brake Disc Bolts: 23 N·m (2.3 kgf·m, 17 ft·lb)**
 - Follow the tightening sequence as specified in the figure.
 - Front [A]
 - Rear [B]



12-22 BRAKES

Brake Disc

Brake Disc Wear Inspection

- Measure the thickness of each disc [A] at the point where it has worn the most.

Measuring Area [B]

Brake Discs Thickness

Standard:

Front:

KLX300D 3.4 ~ 3.7 mm (0.13 ~ 0.15 in.)

KLX300E 3.8 ~ 4.2 mm (0.15 ~ 0.17 in.)

Rear 4.3 ~ 4.7 mm (0.17 ~ 0.19 in.)

Service Limit:

Front:

KLX300D 2.8 mm (0.11 in.)

KLX300E 3.5 mm (0.14 in.)

Rear 3.8 mm (0.15 in.)

★ If the disc has worn past the service limit, replace it.

Brake Disc Warp Inspection

- Raise the wheel off the ground with a suitable stand or jack.

Special Tool - Jack: 57001-1238

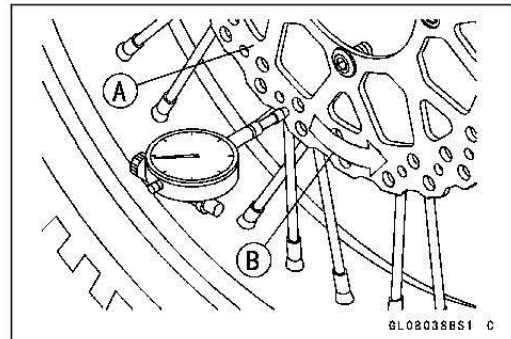
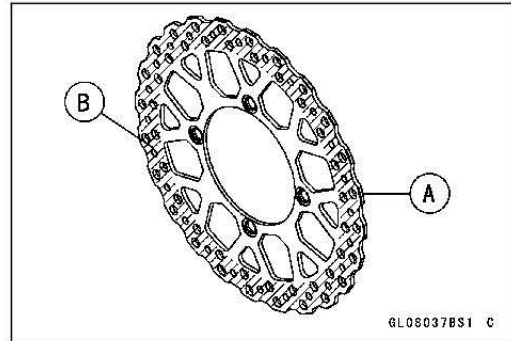
- For front disc inspection, turn the handlebars fully to one side.
- Set up a dial gauge against the disc [A] as shown and measure disc runout, while turning [B] the wheel by hand.

Disc Runout

Standard: TIR 0.12 mm (0.0047 in.) or less

Service Limit: TIR 0.3 mm (0.01 in.)

★ If runout exceeds the service limit, replace the disc.



Brake Fluid

Brake Fluid Level Inspection

- Refer to the Brake Fluid Level Inspection ([see Brake Fluid Level Inspection\(2-42\)](#)).

Brake Fluid Change

- Refer to the Brake Fluid Change ([see Brake Fluid Change\(2-43\)](#)).

Brake Line Bleeding

The brake fluid has a very low compression coefficient so that almost all the movement of the brake lever or pedal is transmitted directly to the caliper for braking action. Air, however, is easily compressed. When air enters the brake lines, brake lever or pedal movement will be partially used in compressing the air. This will make the lever or pedal feel spongy, and there will be a loss in braking power.

WARNING

Air in the brake lines diminish braking performance and can cause an accident resulting in injury or death. If the brake lever or pedal has a soft or "spongy" feeling mushy when it is applied, there might be air in the brake lines or the brake may be defective. Do not operate the vehicle and service the brake system immediately.

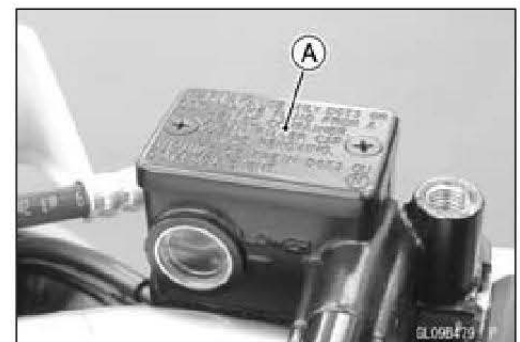
NOTICE

Brake fluid quickly damages painted plastic surfaces; any spilled fluid should be completely washed away immediately.

NOTE

- *The procedure to bleed the front brake line is as follows. Bleeding the rear brake line is the same as for the front brake.*

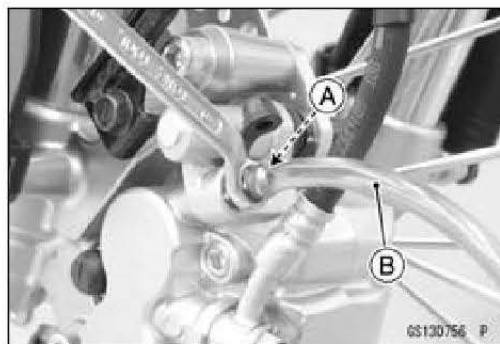
- Remove the reservoir cap [A] and diaphragm.
- Fill the reservoir with fresh brake fluid to the upper level line in the reservoir.
- Slowly pump the brake lever several times until no air bubbles can be seen rising up through the fluid from the holes at the bottom of the reservoir.
- Bleed the air completely from the master cylinder by this operation.



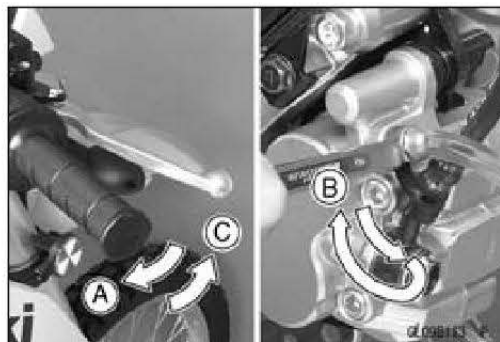
12-24 BRAKES

Brake Fluid

- Open the rubber cap from the bleed valve [A].
- Attach a clear plastic hose [B] to the bleed valve, and run the other end of the hose into a container.



- Bleed the brake line and the caliper.
- Repeat this operation until no more air can be seen coming out into the plastic hose.
- 1. Pump the brake lever until it becomes hard, and apply the brake and hold it [A].
- 2. Quickly open and close [B] the bleed valve while holding the brake applied.
- 3. Release the brake [C].



NOTICE

After pumping the brake lever several times, releasing it without opening and closing of the bleed valve may cause brake fluid to be blown back from the master cylinder reservoir. Brake fluid spilt on painted surfaces and plastic parts will quickly damage them. Be sure to open and close the bleed valve.

NOTE

- The fluid level must be checked often during the bleeding operation and replenished with fresh brake fluid as necessary. If the fluid in the reservoir runs completely out any time during bleeding, the bleeding operation must be done over again from the beginning since air will have entered the line.
 - Tap the brake hose lightly from the caliper to the reservoir for more complete bleeding.
 - Remove the clear plastic hose.
 - Tighten the bleed valve, and install the rubber cap.
- Torque - Clipper Bleed Valve: 7.8 N·m (0.80 kgf·m, 69 in·lb)**
- Check the fluid level (see Brake Fluid Level Inspection(2-42)).
 - Install the diaphragm, diaphragm plate and reservoir cap.
 - Tighten:
- Torque - Brake Reservoir Cap Screws: 1.5 N·m (0.15 kgf·m, 13 in·lb)**

Brake Fluid



WARNING

When working with the disc brake, observe the precautions listed below.

- Never reuse old brake fluid.
- Do not use fluid from a container that has been left unsealed or that has been open for a long time.
- Do not mix two types and brands of fluid for use in the brake. This lowers the brake fluid boiling point and could cause the brake to be ineffective. It may also cause the rubber brake parts to deteriorate.
- Do not leave the reservoir cap off for any length of time to avoid moisture contamination of the fluid.
- Do not change the fluid in the rain or when a strong wind is blowing.
- Except for the disc pads and disc, use only disc brake fluid, isopropyl alcohol, or ethyl alcohol for cleaning of the brake parts. Do not use any other fluid for cleaning these parts. Gasoline, engine oil, or any other petroleum distillate will cause deterioration of the rubber parts. Oil spilled on any part will be difficult to wash off completely and will eventually deteriorate the rubber used in the disc brake.
- When handling the disc pads or disc, be careful that no disc brake fluid or any oil gets on them. Clean off any fluid or oil that inadvertently gets on the pads or disc with a high flash-point solvent. Do not use one which will leave an oily residue. Replace the pads with new ones if they cannot be cleaned satisfactorily.
- Brake fluid quickly damages painted surfaces; any spilled fluid should be completely wiped up immediately.
- If any of the brake line fittings or the bleed valve is opened at any time, the AIR MUST BE BLED FROM THE BRAKE LINE.

12-26 BRAKES

Brake Hose

Brake Hose Removal/Installation

- Refer to the Brake Hose Replacement ([see Brake Hose Replacement\(2-44\)](#)).

Brake Hose Inspection

- Refer to the Brake System Inspection ([see Brake System Inspection\(2-41\)](#)).

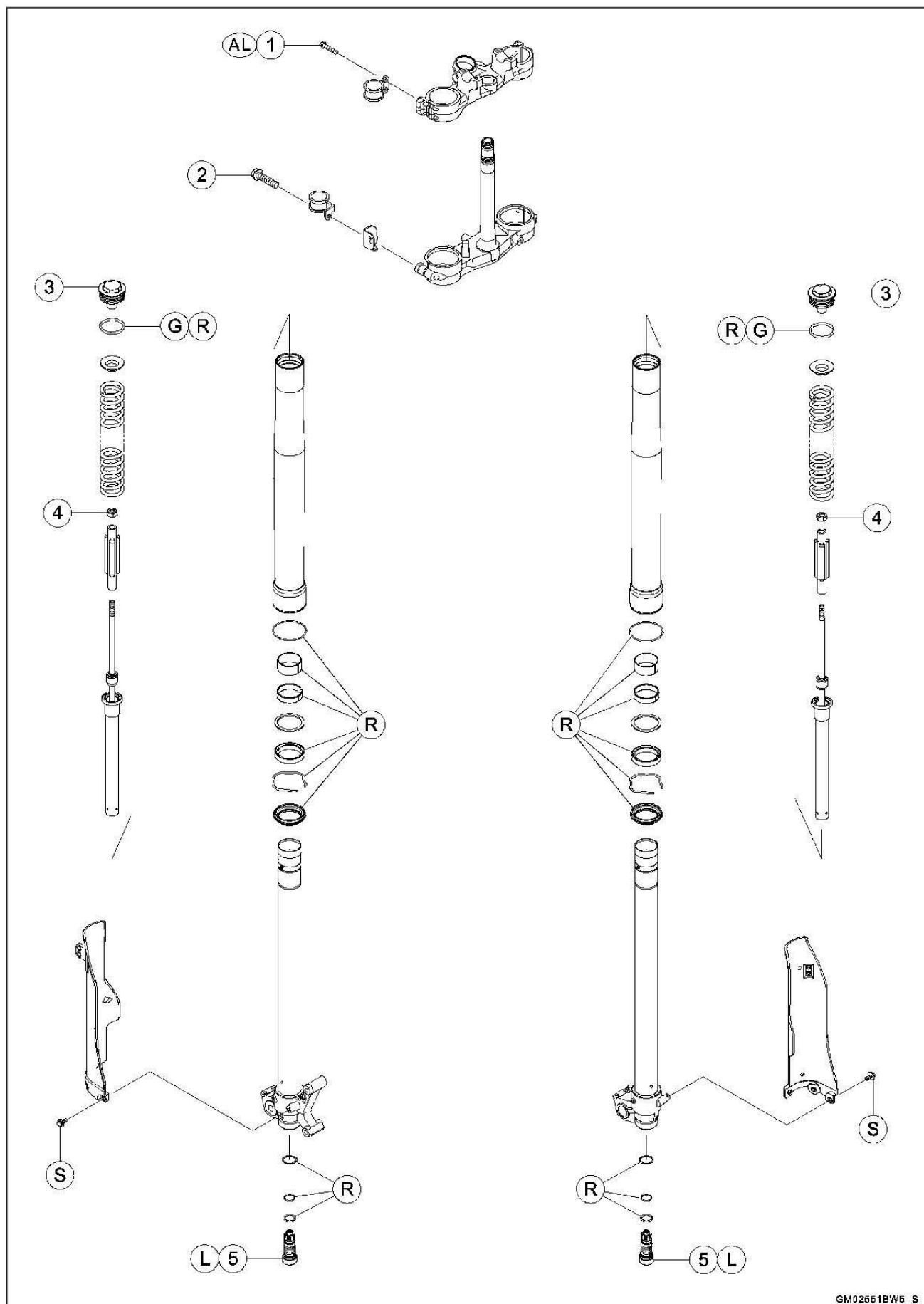
Suspension

Table of Contents

Exploded View	13-2
Specifications	13-6
Special Tools	13-8
Front Fork	13-9
Compression Damping Force Adjustment	13-9
Front Fork Removal	13-9
Front Fork Installation	13-10
Front Fork Oil Change	13-11
Front Fork Disassembly	13-13
Front Fork Assembly	13-15
Inner Tube, Outer Tube Inspection	13-16
Dust Seal Inspection	13-17
Spring Tension Inspection	13-17
Rear Shock Absorber	13-18
Rebound Damping Force Adjustment	13-18
Compression Damping Force Adjustment	13-19
Spring Preload Adjustment	13-19
Rear Shock Absorber Removal	13-20
Rear Shock Absorber Installation	13-21
Rear Shock Absorber Scrapping	13-21
Swingarm	13-22
Swingarm Removal	13-22
Swingarm Installation	13-23
Swingarm Bearing Removal	13-23
Swingarm Bearing Installation	13-23
Needle Bearing, Sleeve Inspection	13-24
Tie-Rod, Rocker Arm	13-25
Tie-Rod Removal	13-25
Tie-Rod Installation	13-25
Rocker Arm Removal	13-25
Rocker Arm Installation	13-26
Tie-Rod and Rocker Arm Bearing Removal	13-27
Tie-Rod and Rocker Arm Bearing Installation	13-28
Rocker Arm Sleeve Inspection	13-28
Needle Bearing Inspection	13-29
Rocker Arm Bolt Bent Inspection	13-29

13-2 SUSPENSION

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Upper Front Fork Clamp Bolts	20	2.0	15	AL
2	Lower Front Fork Clamp Bolts	25	2.5	18	
3	Front Fork Top Plugs	30	3.1	22	
4	Piston Rod Nuts	15	1.5	11	
5	Front Fork Cylinder Valve Assy	55	5.6	41	L

AL: Tighten the two clamp bolts alternately two times to ensure even tightening torque.

G: Apply grease.

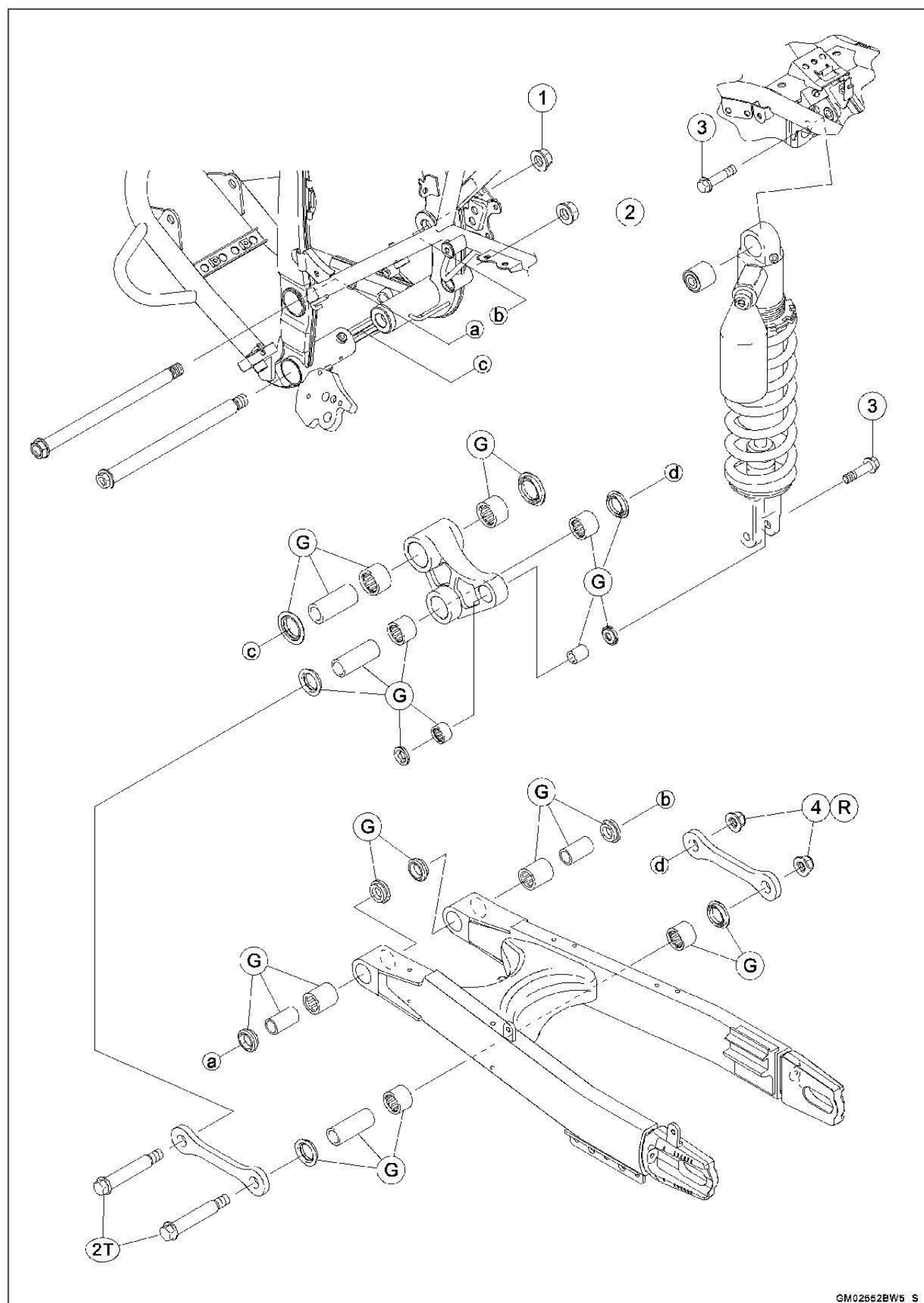
L: Apply a non-permanent locking agent.

R: Replacement Parts

S: Follow the specified tightening sequence.

13-4 SUSPENSION

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Swingarm Pivot Shaft Nut	88	9.0	65	
2	Rocker Arm Nut	98	10	72	
3	Rear Shock Absorber Bolts	39	4.0	29	
4	Tie-Rod Nuts	83	8.5	61	R

G: Apply grease.

R: Replacement Parts

2T: Apply 2-stroke oil.

13-6 SUSPENSION

Specifications

Item	Standard
Front Fork (KLX300D)	
Fork Inner Tube Diameter	$\phi 43$ mm (1.7 in.)
Air Pressure	Atmospheric pressure (non-adjustable)
Compression Damper Setting	12 clicks from the fully clockwise position [Usable Range: 0 $\longleftrightarrow$ 16 clicks]
Suspension Oil	Kawasaki KHL15-10 or equivalent
Amount:	
When Changing Oil	Approx. 455 mL (15.4 US oz.)
After Disassembly and Completely Dry	531 $\pm$ 4 mL (18.0 $\pm$ 0.14 US oz.)
Fork Oil Level	101 $\pm$ 2 mm (3.98 $\pm$ 0.08 in.) (Fully compressed, without spring, below from the top of outer tube)
Fork Spring Free Length	412.3 mm (16.23 in.) [Service Limit: 405 mm (15.9 in.)]
Front Fork (KLX300E)	
Fork Inner Tube Diameter	$\phi 43$ mm (1.7 in.)
Air Pressure	Atmospheric pressure (non-adjustable)
Compression Damper Setting	12 clicks from the fully clockwise position [Usable Range: 0 $\longleftrightarrow$ 16 clicks]
Suspension Oil	Kawasaki KHL15-10 or equivalent
Amount:	
When Changing Oil	Approx. 450 mL (15.2 US oz.)
After Disassembly and Completely Dry	527 $\pm$ 4 mL (17.8 $\pm$ 0.14 US oz.)
Fork Oil Level	104 $\pm$ 2 mm (4.09 $\pm$ 0.08 in.) (Fully compressed, without spring, below from the top of outer tube)
Fork Spring Free Length	387.3 mm (15.25 in.) [Service Limit: 380 mm (15.0 in.)]
Rear Shock Absorber (KLX300D)	
Rebound Damper Setting	24 clicks from the fully clockwise position [Usable Range: 0 $\longleftrightarrow$ 30 clicks]
Compression Damper Setting	16 clicks from the fully clockwise position [Usable Range: 0 $\longleftrightarrow$ 20 clicks]
Spring Preload Setting Position	(Spring length) 245.5 mm (9.665 in.) [Usable Range: 240.5 ~ 262.5 mm (9.468 ~ 10.33 in.)]
Gas Pressure	1 000 kPa (10.20 kgf/cm ² , 145 psi, non-adjustable)
Rear Shock Absorber (KLX300E)	
Rebound Damper Setting	18 clicks from the fully clockwise position [Usable Range: 0 $\longleftrightarrow$ 30 clicks]
Compression Damper Setting	16 clicks from the fully clockwise position [Usable Range: 0 $\longleftrightarrow$ 20 clicks]
Spring Preload Setting Position	(Spring length) 222.0 mm (8.740 in.) [Usable Range: 213.5 ~ 235.5 mm (8.405 ~ 9.272 in.)]

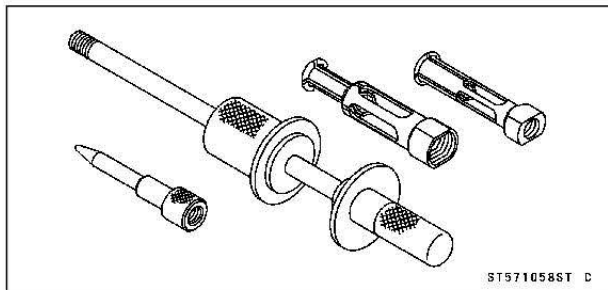
Specifications

Item	Standard
Gas Pressure	1 000 kPa (10.20 kgf/cm ² , 145 psi, non-adjustable)
Tie-Rod, Rocker Arm Sleeve Outside Diameter: Large Middle Small Rocker Arm Bolt Runout	24.987 ~ 25.000 mm (0.98374 ~ 0.98425 in.) [Service Limit: 24.85 mm (0.9783 in.)] 21.987 ~ 22.000 mm (0.86563 ~ 0.86614 in.) [Service Limit: 21.85 mm (0.8602 in.)] 15.989 ~ 16.000 mm (0.62949 ~ 0.62992 in.) [Service Limit: 15.85 mm (0.6240 in.)] TIR 0.1 mm (0.004 in.) or less [Service Limit: TIR 0.2 mm (0.008 in.)]

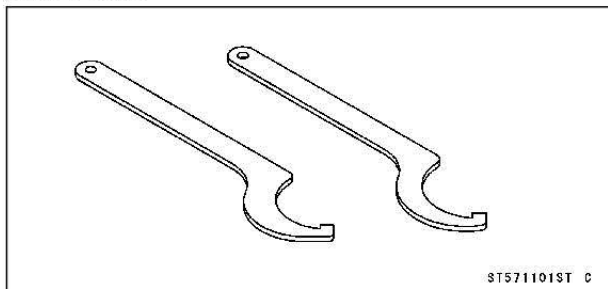
13-8 SUSPENSION

Special Tools

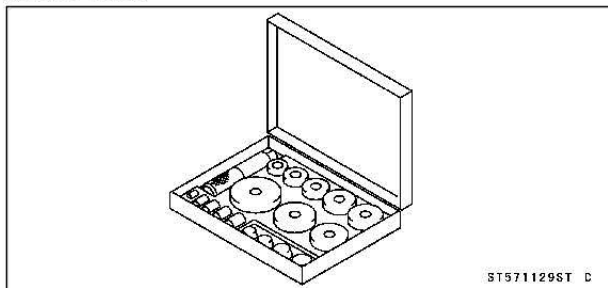
Oil Seal & Bearing Remover:
57001-1058



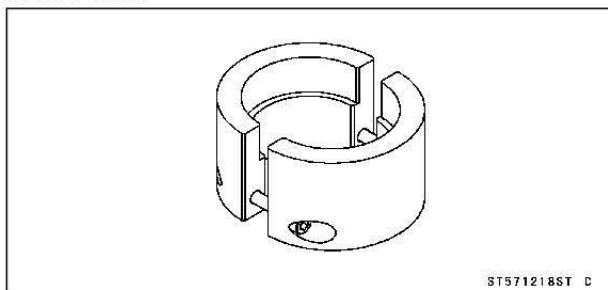
Hook Wrench R37.5, R42:
57001-1101



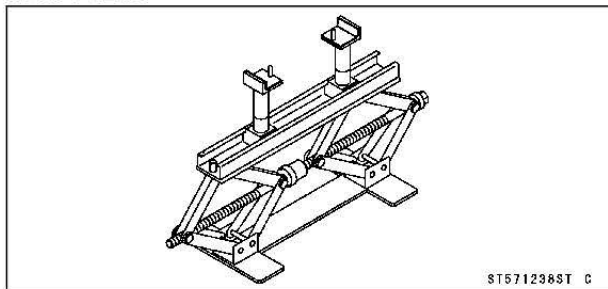
Bearing Driver Set:
57001-1129



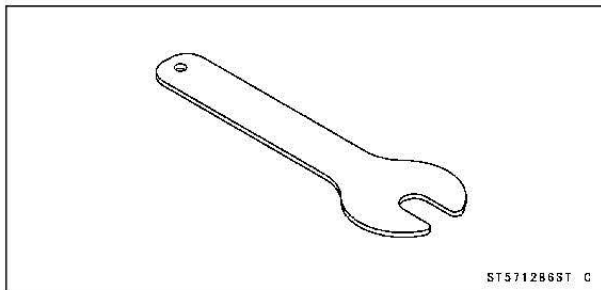
Fork Outer Tube Weight:
57001-1218



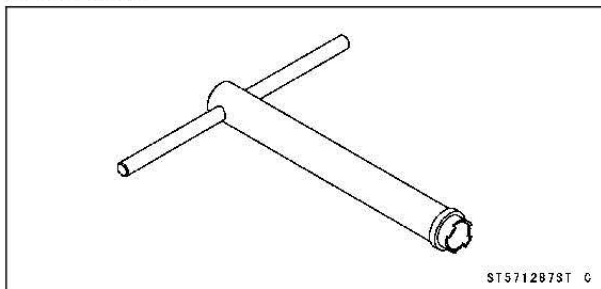
Jack:
57001-1238



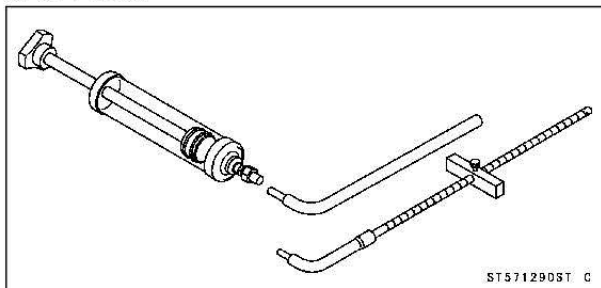
Fork Spring Holder:
57001-1286



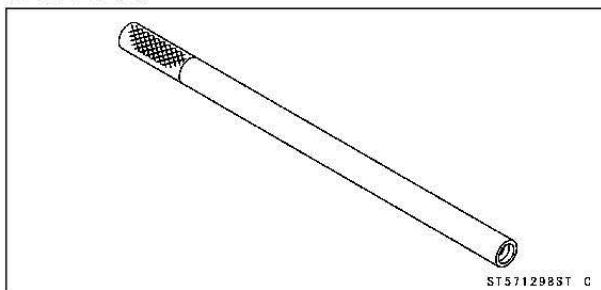
Fork Cylinder Holder:
57001-1287



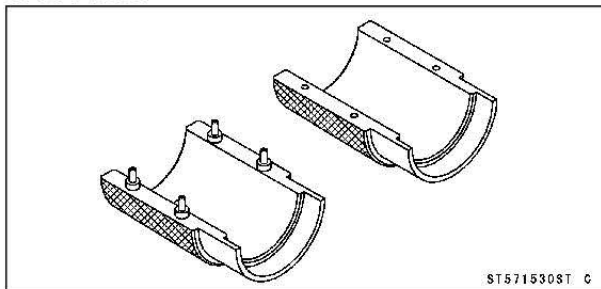
Fork Oil Level Gauge:
57001-1290



Fork Piston Rod Puller, M10 × 1.0:
57001-1298



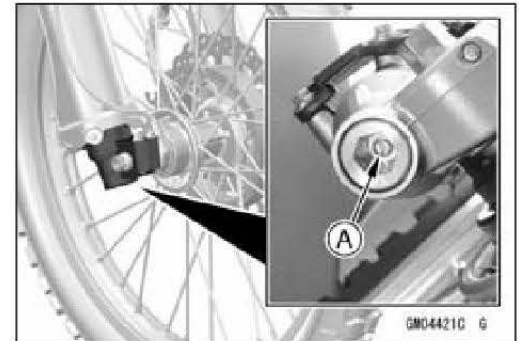
Fork Oil Seal Driver, $\phi 43$:
57001-1530



Front Fork

Compression Damping Force Adjustment

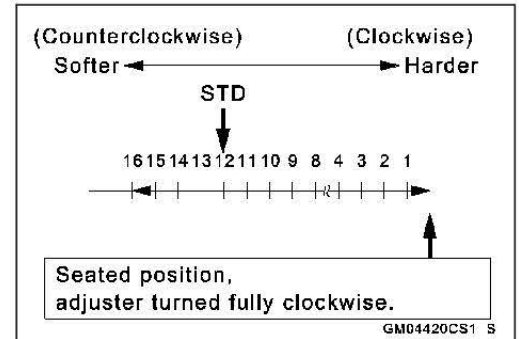
- To adjust the compression damping force, turn the compression damping adjuster [A].
- The standard adjuster setting is the **12 clicks** from the fully clockwise position.



- The damping force can be left soft for average riding. But it should be adjusted harder for high speed riding or riding with a passenger. If the damping feels too soft or too stiff, adjust it in accordance with the following table.

Compression Damping Force Adjustment

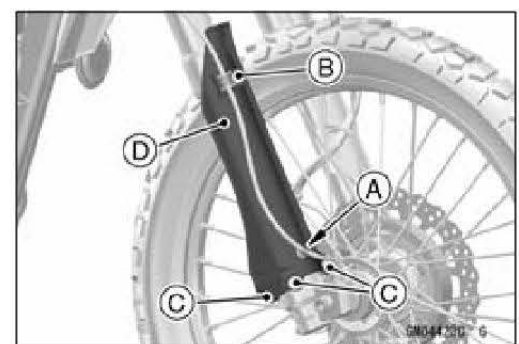
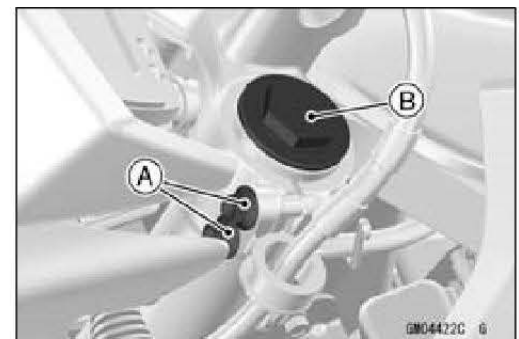
Adjuster Position	Damping Force	Setting	Load	Road	Speed
16 clicks	Weak	Soft	Light	Good	Low
↑	↑	↑	↑	↑	↑
↓	↓	↓	↓	↓	↓
0	Strong	Hard	Heavy	Bad	High



Front Fork Removal

- ★ If disassembling the front fork after removing it, loosen the front fork top plug according to the followings.

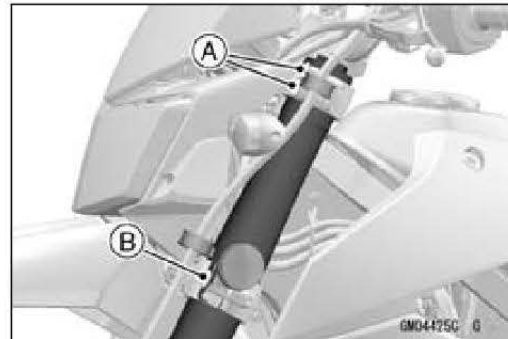
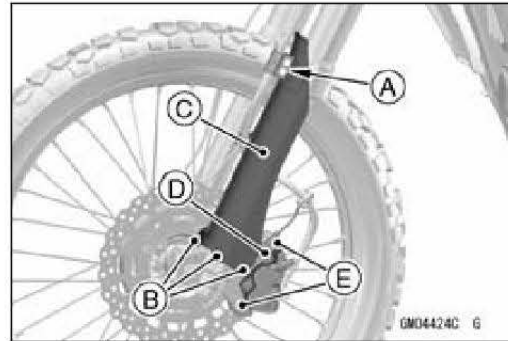
- Remove:
Handlebars (see Handlebar Removal(14-12))
- Loosen:
Upper Front Fork Clamp Bolts [A]
Front Fork Top Plug [B]
- Loosen the upper front fork clamp bolts first.
- Cover the front fork top plug with a plastic bag to protect it.
- Open:
Clamp [A]
- Remove:
Bolt [B] and Clamp
Bolts [C]
Right Protector [D]



13-10 SUSPENSION

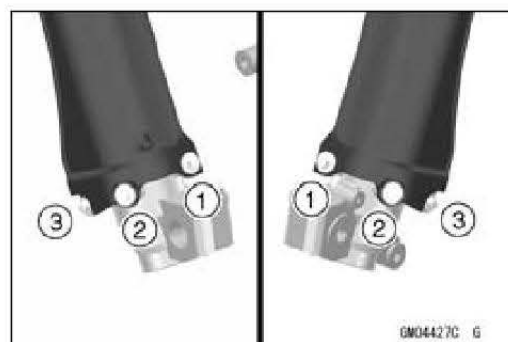
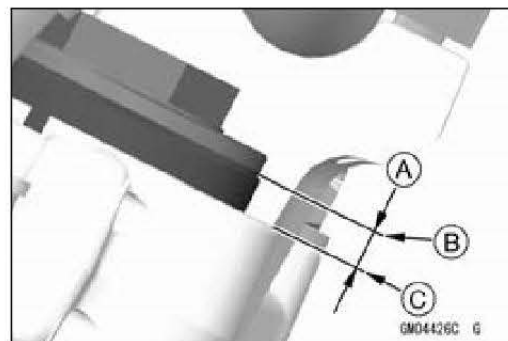
Front Fork

- Remove:
 - Bolts [A] and Clamps
 - Bolts [B]
 - Left Protector [C]
 - Bolt [D]
 - Front Caliper Mounting Bolts [E]
- Put the front caliper on a suitable stand to avoid damaging.
- Remove:
 - Front Wheel (see [Front Wheel Removal\(10-7\)](#))
- Loosen:
 - Upper Front Fork Clamp Bolts [A]
 - Lower Front Fork Clamp Bolt [B]
- With a twisting motion, remove the fork leg down and out.



Front Fork Installation

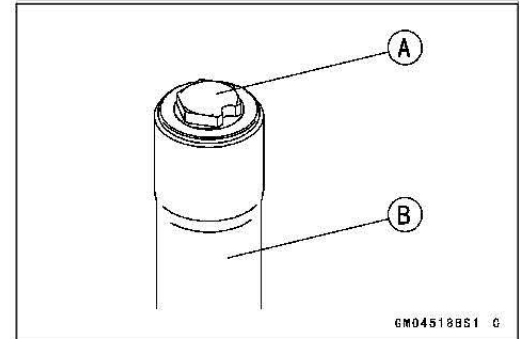
- Insert the fork leg.
- Position the fork leg as shown.
 - 6 mm (0.2 in.) [A]
 - Outer Tube End [B]
 - Steering Stem Head [C]
- Tighten:
 - Torque - Lower Front Fork Clamp Bolt: 25 N·m (2.5 kgf·m, 18 ft·lb)**
- Tighten:
 - Torque - Front Fork Top Plug: 30 N·m (3.1 kgf·m, 22 ft·lb)**
 - Torque - Upper Front Fork Clamp Bolts: 20 N·m (2.0 kgf·m, 15 ft·lb)**
- Before tightening the upper front fork clamp bolt, tighten the front fork top plug as necessary.
- Cover the front fork top plug with a plastic bag to protect it.
- Tighten the two upper front fork clamp bolts alternately two times to ensure even tightening torque.
- Install the protectors so that they do not touch the front fork outer tubes.
- Tighten their bolts in order from the front side as shown.
- Install the removed parts.
- Adjust the compression damper setting (see [Compression Damping Force Adjustment\(13-9\)](#)).



Front Fork

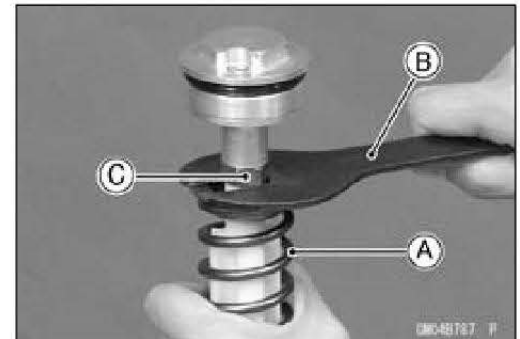
Front Fork Oil Change

- Remove the front fork (see Front Fork Removal(13-9)).
- Hold the outer tube vertically and hold the inner tube lower end in a vice.
- Remove the top plug [A] from the outer tube [B] and slowly slide down the outer tube.

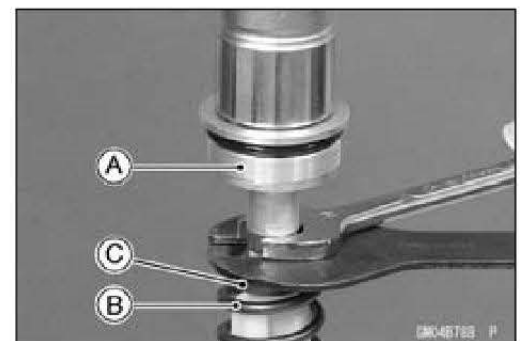


- Push down the fork spring [A] to engage the fork spring holder [B] below the piston rod nut [C].

Special Tool - Fork Spring Holder: 57001-1286



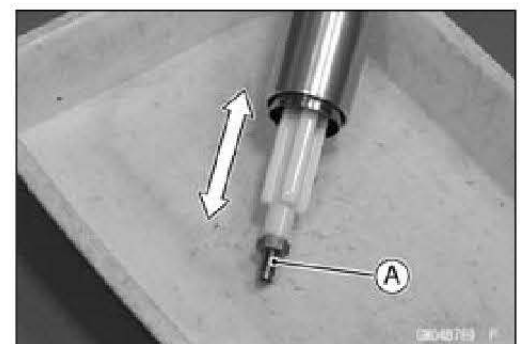
- Using a wrench, loosen the piston rod nut and remove the top plug [A].
- Push down the fork spring [B] to remove the fork spring holder, and then remove the fork spring and spring seat [C].



- Remove the fork tube from the vise, and drain the fork oil into a suitable container.

NOTE

- To drain off fork oil, hold the fork tube downward and move the piston rod [A] up and down, more than ten times



13-12 SUSPENSION

Front Fork

- Hold the fork tube upright in a vise, press the outer tube [A] and the piston rod all the way down.
- Pour in the specified type of oil.

Suspension Oil - KHL15-10 (1 L): 44091-0004
KHL15-10 (4 L): 44091-0013

KLX300D

Amount:

When changing oil **Approx. 455 mL (15.4 US oz.)**

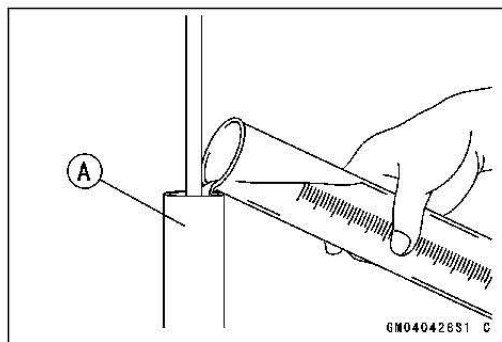
After disassembly and completely dry **531 ±4 mL (18.0 ±0.14 US oz.)**

KLX300E

Amount:

When changing oil **Approx. 450 mL (15.2 US oz.)**

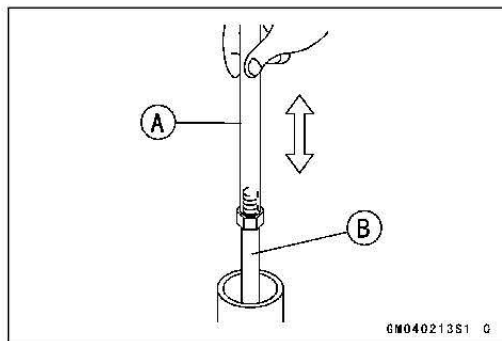
After disassembly and completely dry **527 ±4 mL (17.8 ±0.14 US oz.)**



- Using the fork piston rod puller [A], move the piston rod [B] up and down more than 10 times in order to discharge all the air from the fork oil.

Special Tool - Fork Piston Rod Puller, M10 × 1.0: 57001-1298

- Remove the fork piston rod puller.
- Pump the outer tube up and down several times to discharge the air between the outer tube and inner tube.
- Wait until the oil level stabilizes.



- Measure the distance from the top of the inner tube to the fork oil, using the fork oil level gauge [A].

Special Tool - Fork Oil Level Gauge: 57001-1290

- With the front fork fully compressed and without fork spring, insert the gauge tube into the inner tube [B] and position the stopper [C] across the top end [D] of the inner tube.

- Set the gauge stopper so that its lower side shows the oil level distance specified [E].

[F] Outer Tube

Oil Level (Fully compressed, without spring)

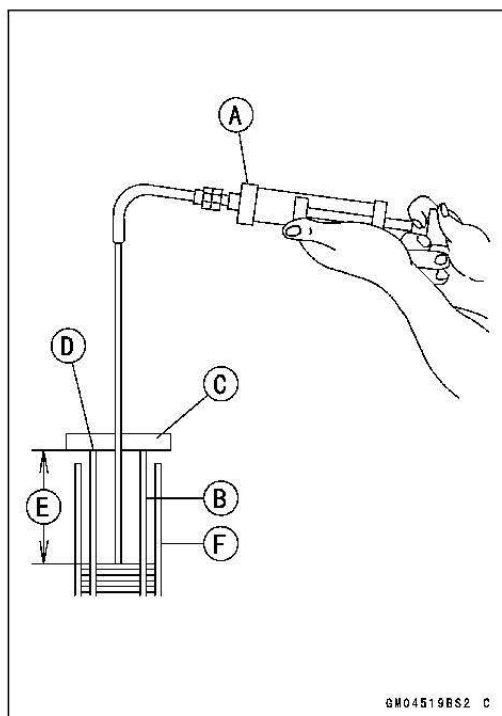
Standard:

KLX300D **101 ±2 mm (3.98 ±0.08 in.)**

KLX300E **104 ±2 mm (4.09 ±0.08 in.)**

- Pull the handle slowly to pump out the excess oil until the oil no longer comes out.

- ★ If no oil is pumped out, there is insufficient oil in the inner tube. Pour in enough oil, then pump out the excess oil.



Front Fork

- Install the fork piston rod puller [A] onto the push rod, and slowly pull up the fork piston rod puller.

Special Tool - Fork Piston Rod Puller, M10 × 1.0: 57001-1298

NOTE

○Be careful for fork oil spillage from the inner tube.

- Insert the fork spring into the inner tube, and set the spring guide on the spring.
- Push down the fork spring to engage the fork spring holder [B] below the piston rod nut [C].

Special Tool - Fork Spring Holder: 57001-1286

- Remove the fork piston rod puller.
- Replace the O-ring [A] on the top plug with a new one.
- Install the top plug on the piston rod.
- Holding the top plug with a wrench, tighten the piston rod nut [B] against the top plug.

Torque - Piston Rod Nut: 15 N·m (1.5 kgf·m, 11 ft·lb)

- Push down the fork spring to remove the fork spring holder.
- Lift up the outer tube and install the top plug.
- Tighten:

Torque - Front Fork Top Plug: 30 N·m (3.1 kgf·m, 22 ft·lb)

- Install the front fork (see Front Fork Installation(13-10)).

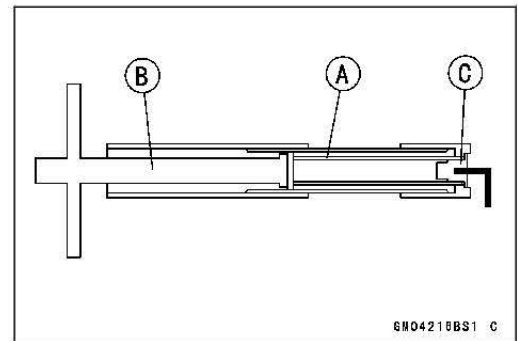
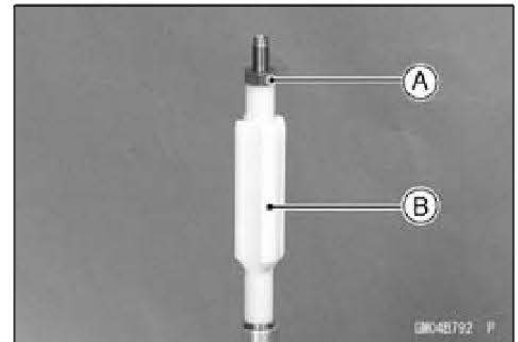
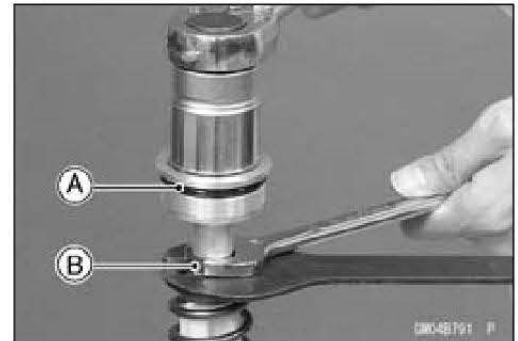
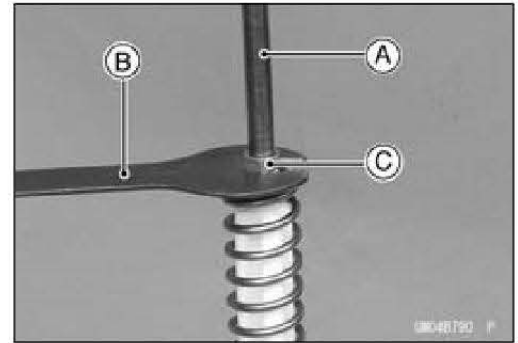
Front Fork Disassembly

- Drain the fork oil (see Front Fork Oil Change(13-11)).
- Remove:
 - Piston Rod Nut [A]
 - Spring Guide [B]

- Lay the front fork sideways and hold it in a vise.
- Compress the outer tube fully.
- Hold the cylinder unit [A] with the fork cylinder holder [B].

Special Tool - Fork Cylinder Holder: 57001-1287

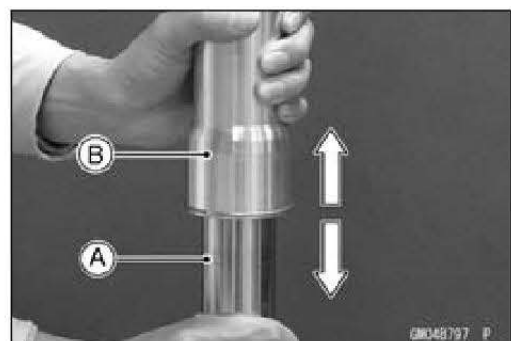
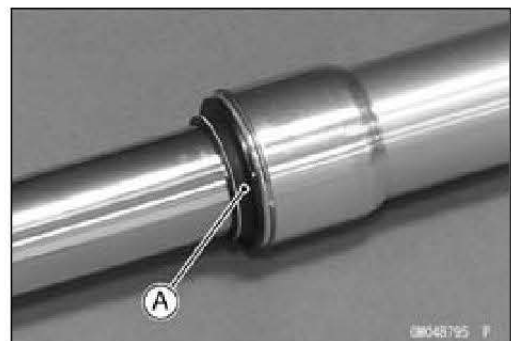
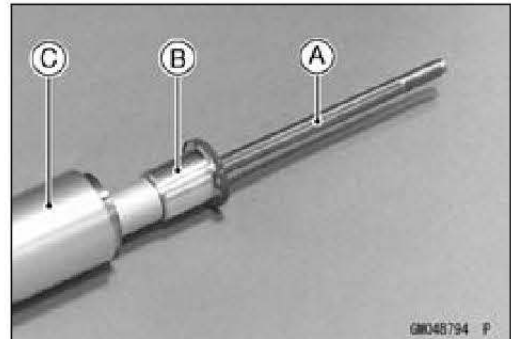
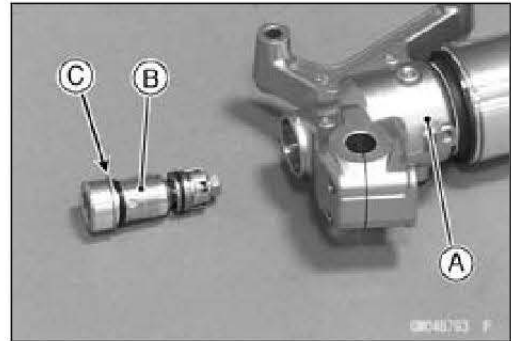
- Loosen the cylinder valve assy [C].



13-14 SUSPENSION

Front Fork

- Remove the followings from the inner tube [A].
Cylinder Valve Assy [B]
Gasket [C]
- Remove the piston rod [A] and cylinder unit [B] from the inner tube [C].
- Pull up the dust seal [A].
- Free the fork tube from the vise.
- Remove the retaining ring [A] from the outer tube.
- Holding the inner tube [A] by hand, pull the outer tube [B] several times to pull out the outer tube.

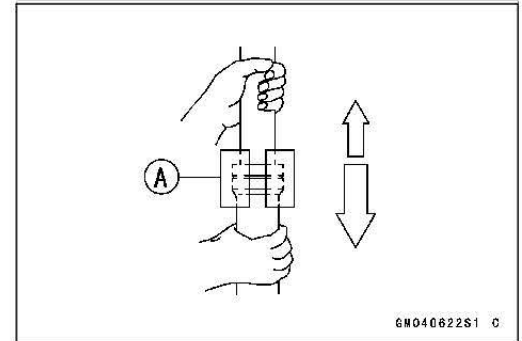


Front Fork

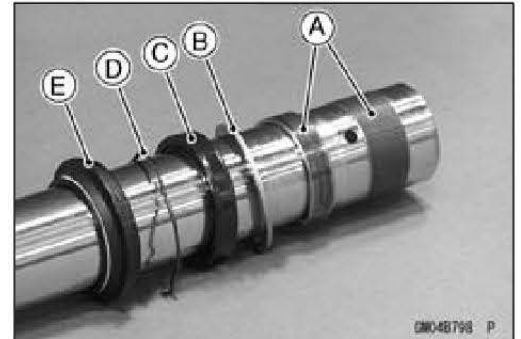
NOTE

○If the outer tube does not detach easily, set the fork outer tube weight [A] onto it to separate the inner and outer tubes.

Special Tool - Fork Outer Tube Weight: 57001-1218

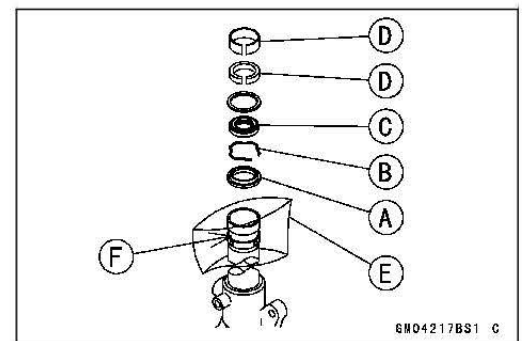


- Remove the following parts from the inner tube.
 - Guide Bushings [A]
 - Washer [B]
 - Oil Seal [C]
 - Retaining Ring [D]
 - Dust Seal [E]



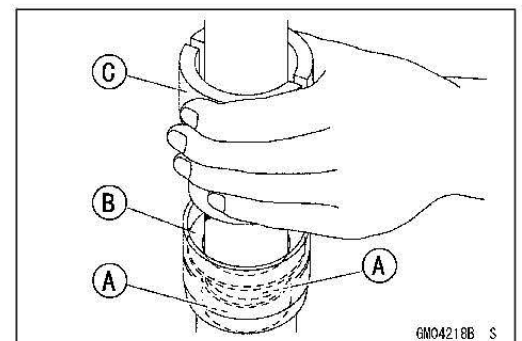
Front Fork Assembly

- Replace the following parts with new ones.
 - Dust Seal [A]
 - Retaining Ring [B]
 - Oil Seal [C]
 - Guide Bushings [D]
- Place an oil coated plastic bag [E] over the end of the inner tube to protect the oil seal.
- The inner tube guide bush groove has a sharp edge [F] that cut out the sealing lip of the seals as they are pushed down over the inner tube.



- Insert the spring band of the dust seal, dust seal, oil seal, washer and guide bush to the inner tube and set the guide bushing to the inner tube.
- When assembling the outer tube guide bushings [A], hold the washer [B] against the guide bushing and tap the washer with the fork oil seal driver [C] until it stops.

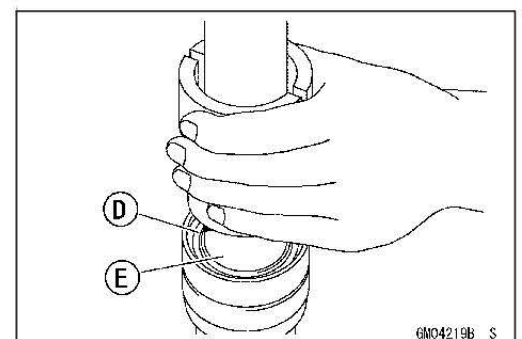
Special Tool - Fork Oil Seal Driver, $\phi 43$: 57001-1530



- Using the fork oil seal driver, press in the oil seal [D] until the it is bottomed.
- Make the oil seal end with the protruding lip [E] face up-ward.

Special Tool - Fork Oil Seal Driver, $\phi 43$: 57001-1530

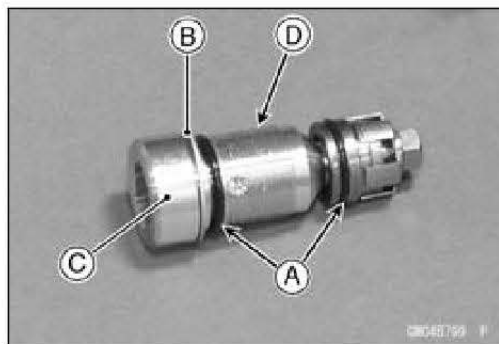
- Install the retaining ring.
- Push the dust seal into the outer tube.
- Set the spring band on the dust seal.



13-16 SUSPENSION

Front Fork

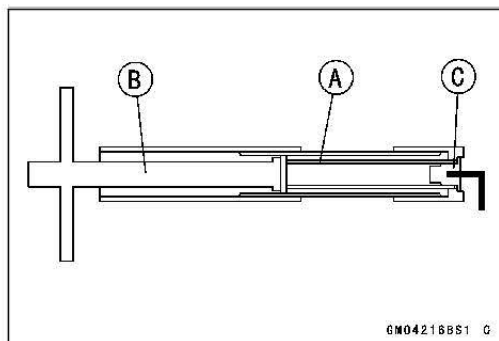
- Replace the O-rings [A] and gasket [B] on the cylinder valve assy [C] with new ones.
- Apply non-permanent locking agent to the threads [D] of the cylinder valve assy.



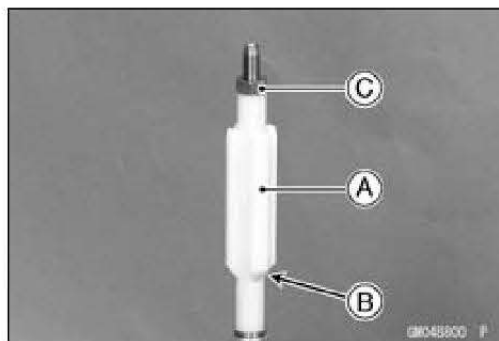
- Lay the front fork sideways and hold it in a vise.
- Compress the outer tube fully.
- Hold the cylinder unit [A] with the fork cylinder holder [B].

Special Tool - Fork Cylinder Holder: 57001-1287

Torque - Front Fork Cylinder Valve Assy [C]: 55 N·m (5.6 kgf·m, 41 ft·lb)



- Stand the front fork vertically and hold the inner tube lower end in a vice.
- Set the spring guide [A] onto the push rod with the tapered end [B] facing downward.
- Install the piston rod nut [C] on the spring guide.
- Pour in the specified type of oil (see Front Fork Oil Change(13-11)).

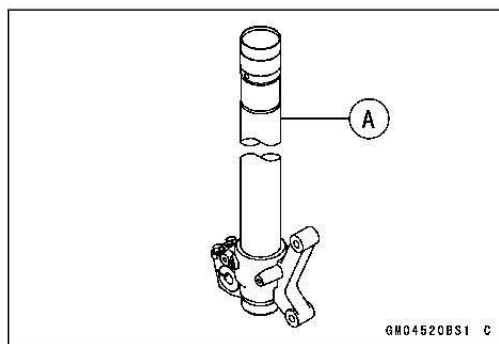


Inner Tube, Outer Tube Inspection

- Visually inspect the inner tube [A].
- ★ If there is any damage, replace the inner tube. Since damage to the inner tube damages the oil seal and dust seal, replace the oil seal and dust seal whenever the inner tube is replaced.

NOTICE

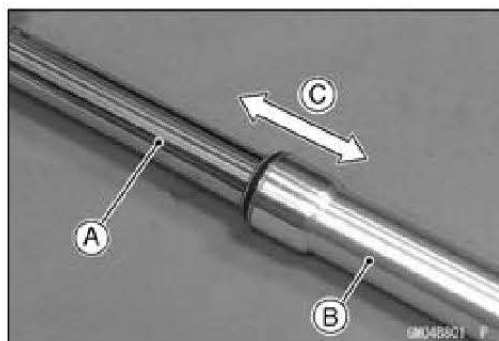
If the inner tube is badly bent or creased, replace it. Excessive bending, followed by subsequent straightening, can weaken the inner tube.



- Temporarily assemble the inner tube [A] and outer tube [B], and pump [C] them back and forth manually to check for smooth operation.
- ★ If you feel binding or catching, the inner and outer tubes must be replaced.

⚠ WARNING

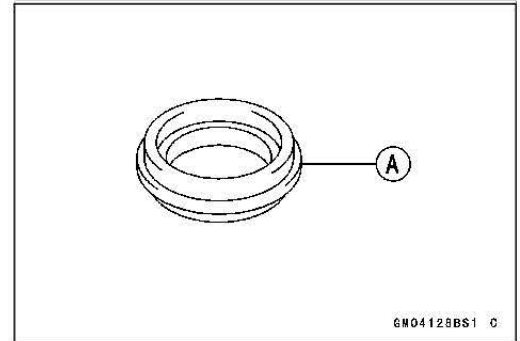
A straightened inner or outer fork tube may fall in use, possibly causing an accident resulting in serious injury or death. Replace a badly bent or damaged inner or outer tube and inspect the other tube carefully before reusing it.



Front Fork

Dust Seal Inspection

- Inspect the dust seal [A] for any signs of deterioration or damage.
- ★ Replace it if necessary.



Spring Tension Inspection

- Since a spring becomes shorter as it weakens, check its free length [A] to determine its condition.

Fork Spring Free Length

Standard:

KLX300D 412.3 mm (16.23 in.)

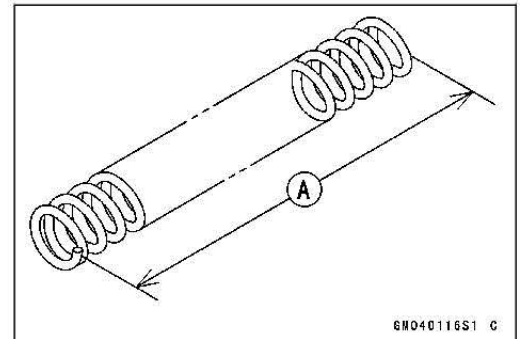
KLX300E 387.3 mm (15.25 in.)

Service Limit:

KLX300D 405 mm (15.9 in.)

KLX300E 380 mm (15.0 in.)

- ★ If the spring of either fork leg is shorter than the service limit, it must be replaced. If the length of a replacement spring and that of the remaining spring vary greatly, the remaining spring should also be replaced in order to keep the fork legs balanced for motorcycle stability.

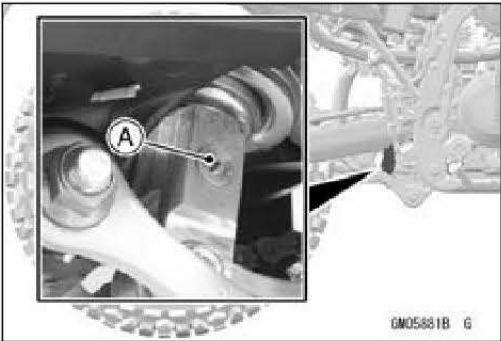


13-18 SUSPENSION

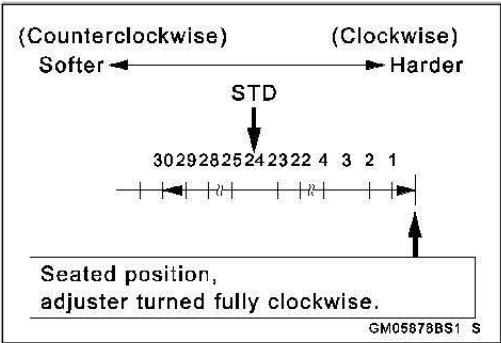
Rear Shock Absorber

Rebound Damping Force Adjustment

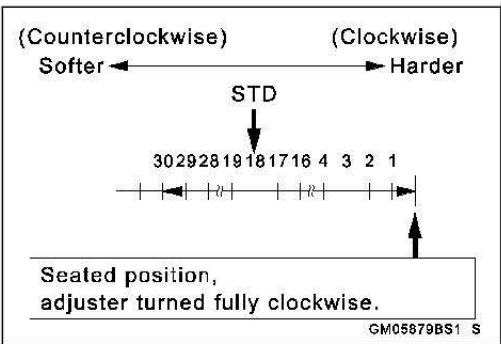
- To adjust the rebound damping force, turn the rebound damping adjuster [A] to the desired position.



- (KLX300D) The standard adjuster setting is the **24 clicks** from the fully clockwise position.



- (KLX300E) The standard adjuster setting is the **18 clicks** from the fully clockwise position.



Rebound Damping Force Adjustment

Adjuster Position	Damping Force	Setting	Load	Road
30 clicks	Weak	Soft	Light	Good
↑	↑	↑	↑	↑
↓	↓	↓	↓	↓
0	Strong	Hard	Heavy	Bad

NOTICE

Do not force the rebound damping adjuster beyond the fully seated position, or the adjusting mechanism may be damaged.

Rear Shock Absorber

Compression Damping Force Adjustment

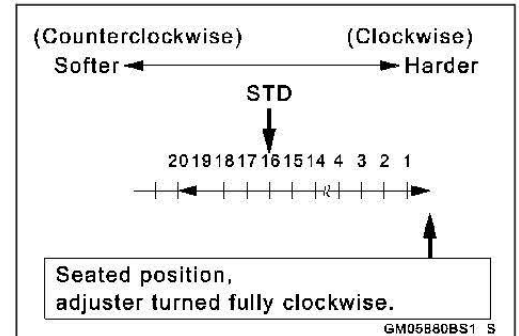
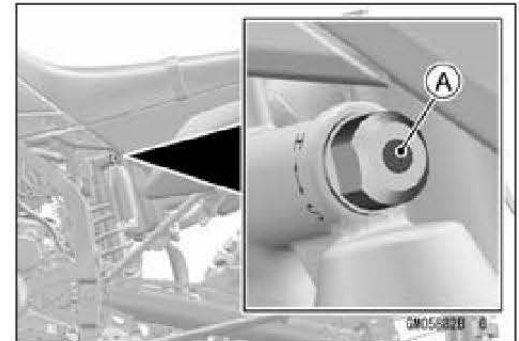
- To adjust the compression damping force, turn the compression damping adjuster [A] to the desired position.
- The standard adjuster setting is the **16 clicks** from the fully clockwise position.

Compression Damping Force Adjustment

Adjuster Position	Damping Force	Setting	Load	Road	Speed
20 clicks	Weak	Soft	Light	Good	Low
↑	↑	↑	↑	↑	↑
↓	↓	↓	↓	↓	↓
0	Strong	Hard	Heavy	Bad	High

NOTICE

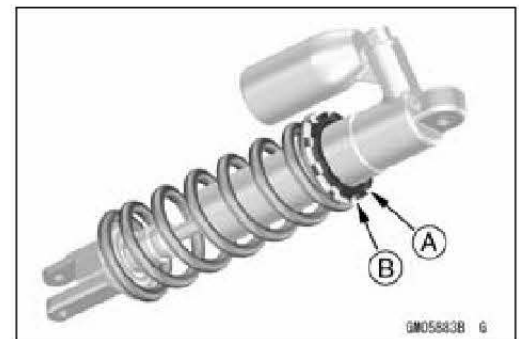
Do not force the compression damping adjuster beyond the fully seated position, or the adjusting mechanism may be damaged.



Spring Preload Adjustment

- Remove the rear shock absorber from the frame (see [Rear Shock Absorber Removal\(13-20\)](#)).
- Loosen the locknut [A] and turn out the adjusting nut [B] to free the spring.

Special Tool - Hook Wrench R37.5, R42: 57001-1101



- To adjust the spring preload, turn in the adjusting nut to the desired position and tighten the locknut.

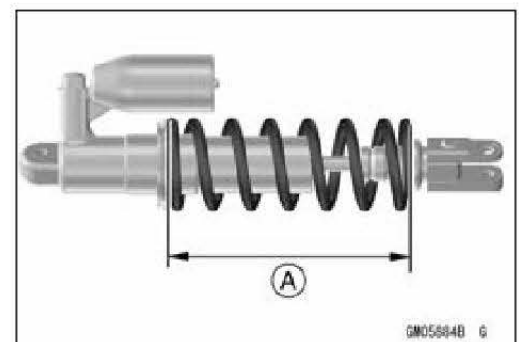
KLX300D

Spring Preload Setting Position (Spring length [A])

Standard: 245.5 mm (9.665 in.)

Spring Adjustment

Adjuster Position	Damping Force	Setting	Load	Road	Speed
240.5 mm (9.468 in.)	Strong	Hard	Heavy	Bad	High
↑	↑	↑	↑	↑	↑
↓	↓	↓	↓	↓	↓
262.5 mm (10.33 in.)	Weak	Soft	Light	Good	Low



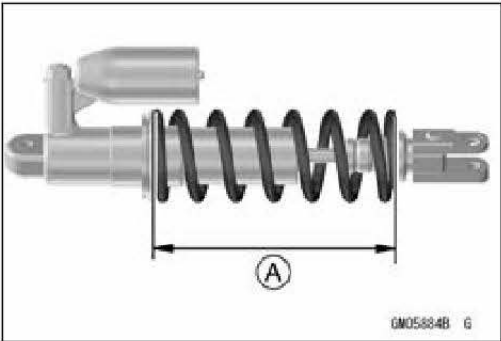
13-20 SUSPENSION

Rear Shock Absorber

KLX300E
Spring Preload Setting Position (Spring length [A])
Standard: 222.0 mm (8.740 in.)

Spring Adjustment

Adjuster Position	Damping Force	Setting	Load	Road	Speed
213.5 mm (8.405 in.)	Strong	Hard	Heavy	Bad	High
↑ ↓	↑ ↓	↑ ↓	↑ ↓	↑ ↓	↑ ↓
235.5 mm (9.272 in.)	Weak	Soft	Light	Good	Low

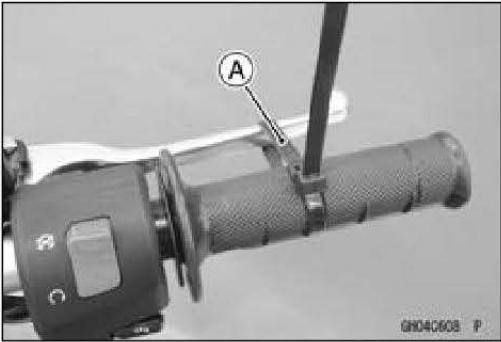


Rear Shock Absorber Removal

- Remove:
Left Side Cover (see Side Cover Removal(15-8))
- Raise the rear wheel off the ground with a suitable stand or jack.
- Special Tool - Jack: 57001-1238
- Squeeze the brake lever, and hold it with a band [A] to prevent the motorcycle from running forward.

 **WARNING**

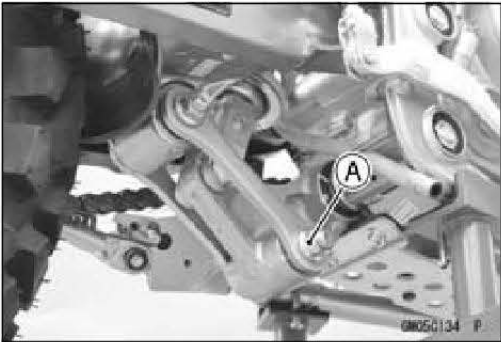
Motorcycle may fall over unexpectedly resulting in an accident or injury. Be sure to hold the front brake when removing the rear wheel.



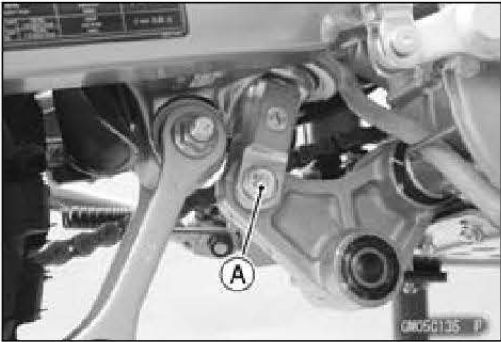
- Remove:
Tie-Rod Nut [A] and Bolt (Front)

NOTICE

When pulling out the mounting bolt, lift the rear wheel slightly. Forcing or tapping on bolt could damage the mounting bolt, sleeve, and bearing.

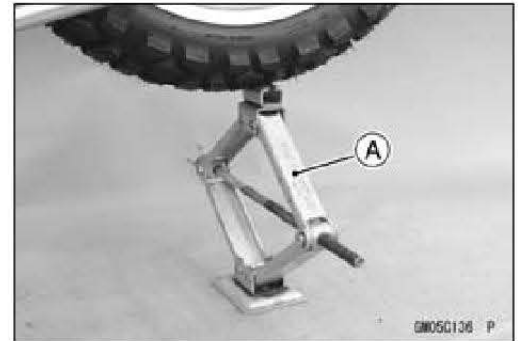


- Remove:
Rear Shock Absorber Bolt (Lower) [A]

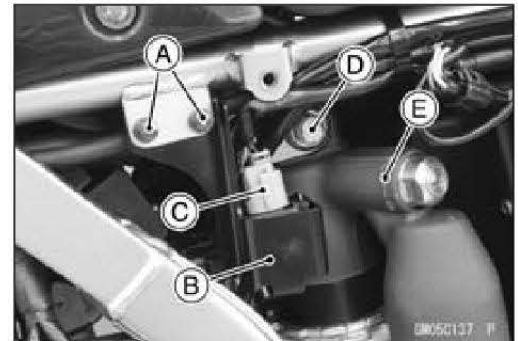


Rear Shock Absorber

- Using an available jack [A], lift the rear wheel to make a space for removing.



- Remove:
 - Bolts [A]
 - Bracket [B] with Vehicle-down Sensor
- Disconnect:
 - Vehicle-down Sensor Connector [C]
- Remove:
 - Rear Shock Absorber Bolt (Upper) [D]
 - Rear Shock Absorber [E]



Rear Shock Absorber Installation

- Replace the tie-rod nut with a new one.
- Install the rear shock absorber.
- Tighten:
 - Torque - Rear Shock Absorber Bolts: 39 N·m (4.0 kgf·m, 29 ft·lb)
 - Tie-Rod Nut: 83 N·m (8.5 kgf·m, 61 ft·lb)
- Install the removed parts.

Rear Shock Absorber Scrapping

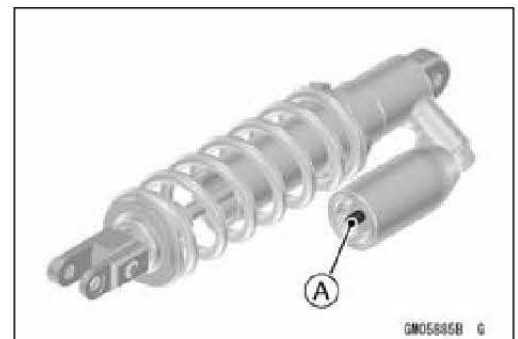
WARNING

Pressurized nitrogen may explode when heated. The rear shock contains nitrogen gas. To avoid an explosion, do not incinerate the shock body without first releasing the nitrogen and removing the schrader valve.

- Remove the rear shock absorber (see Rear Shock Absorber Removal(13-20)).
- Remove the valve cap [A] and release the nitrogen gas completely from the gas reservoir.
- Remove the valve.

WARNING

Pressurized gas can cause injury. Do not point the valve toward your face or body.

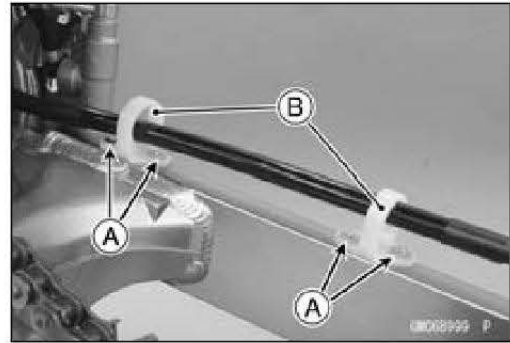


13-22 SUSPENSION

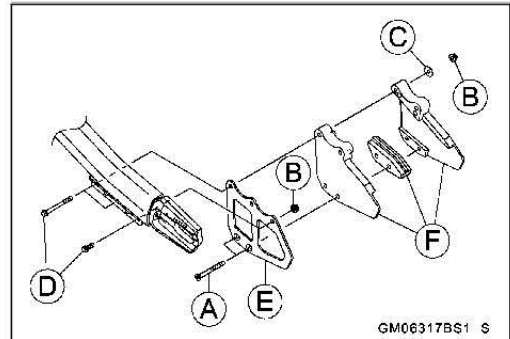
Swingarm

Swingarm Removal

- Remove:
 - Rear Wheel (see [Rear Wheel Removal\(10-9\)](#))
 - Mud Guard (see [Mud Guard Removal\(15-19\)](#))
 - Screws [A]
 - Clamps [B]
- Keep away the rear caliper from the swingarm.
- Take care not to dangle the caliper.



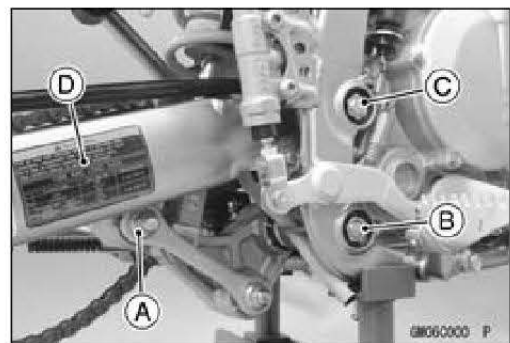
- Remove:
 - Screws [A]
 - Chain Guide Nuts [B]
 - Washers [C]
 - Chain Guide Bolts [D]
 - Chain Guide Plates [E]
 - Rear Chain Guides [F]



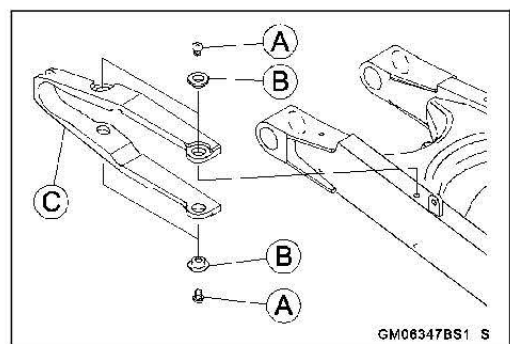
- Remove:
 - Tie-Rod Nut [A] and Bolt

NOTICE

When pulling out the mounting bolt, lift the swingarm wheel slightly. Forcing or tapping on a bolt could damage the bolt, sleeve, and bearing.



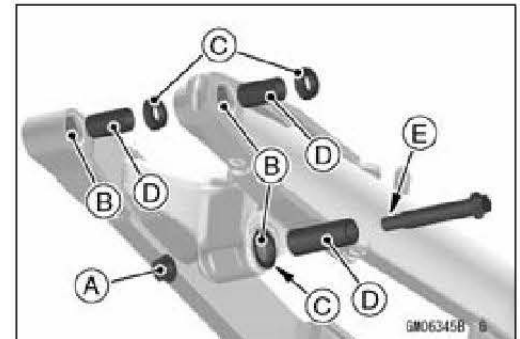
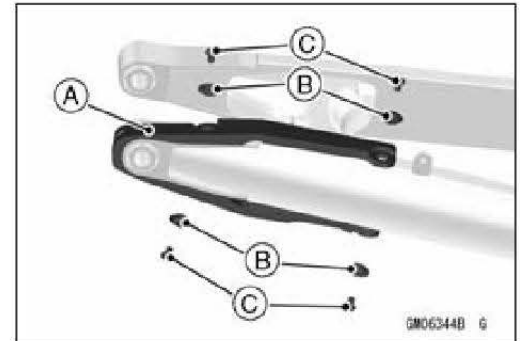
- Loosen:
 - Rocker Arm Nut [B]
- Remove:
 - Swingarm Pivot Shaft Nut [C]
 - Swingarm Pivot Shaft
 - Swingarm [D]
- Remove:
 - Screws [A]
 - Collars [B]
 - Chain Guide [C]



Swingarm

Swingarm Installation

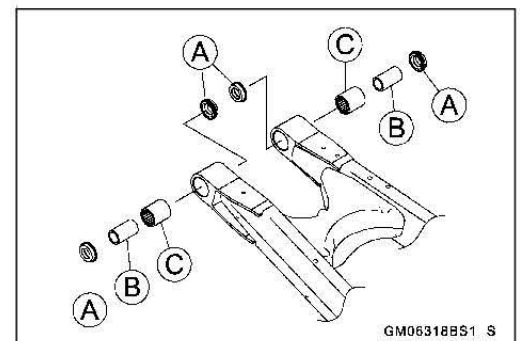
- Install:
 - Chain Guide [A]
 - Collars [B]
- Tighten:
 - Screws [C]
- Replace the tie-rod nut [A] with a new one.
- Apply grease to the following parts.
 - Needle Bearings [B]
 - Grease Seals [C] (Both Sides)
 - Sleeves [D]
- Apply 2-stroke oil to the threads [E] of the tie-rod bolt.



- Tighten:
 - Torque - Swingarm Pivot Shaft Nut: 88 N·m (9.0 kgf·m, 65 ft·lb)
 - Tie-Rod Nut : 83 N·m (8.5 kgf·m, 61 ft·lb)
 - Rocker Arm Nut: 98 N·m (10 kgf·m, 72 ft·lb)
- Install the removed parts.

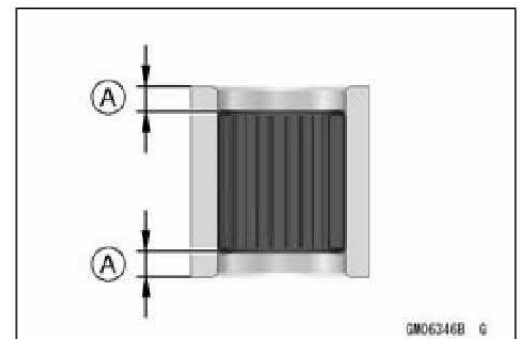
Swingarm Bearing Removal

- Remove:
 - Swingarm (see [Swingarm Removal\(13-22\)](#))
 - Grease Seals [A]
 - Sleeves [B]
 - Remove the needle bearings [C] using the oil seal & bearing remover.
- Special Tool - Oil Seal & Bearing Remover: 57001-1058**



Swingarm Bearing Installation

- Replace the needle bearings and grease seals with new ones.
 - Apply plenty of grease to the needle bearings.
 - Install the needle bearings to the specified position.
 - 5 mm (0.2 in.) [A]
 - Install the other side in the same way.
- Special Tool - Bearing Driver Set: 57001-1129**



13-24 SUSPENSION

Swingarm

Needle Bearing, Sleeve Inspection

NOTICE

Do not remove the bearings for inspection. Removal may damage them.
--

- Inspect the needle bearings installed in the swingarm.
- The needle bearing normally wear very little, and wear is difficult to measure. Instead of measuring, visually inspect the bearings for abrasion, discoloration, or other damage.
- ★ If the needle bearing, and sleeve show any signs of abnormal wear, discoloration, or damage, replace them as a set.

Tie-Rod, Rocker Arm

Tie-Rod Removal

- Raise the rear wheel off the ground with a suitable stand or jack.

Special Tool - Jack: 57001-1238

- Squeeze the brake lever, and hold it with a band [A] to prevent the motorcycle from running forward.



WARNING

Motorcycle may fall over unexpectedly resulting in an accident or injury. Be sure to hold the front brake when removing the rear wheel.

- Remove:
Tie-Rod Bolts and Nuts [A]
Tie-Rods [B]

NOTICE

When pulling out the mounting bolt, lift the swingarm wheel slightly. Forcing or tapping on a bolt could damage the bolt, sleeve, and bearing.

Tie-Rod Installation

- Apply grease to the following parts.
Needle Bearings [A]
Grease Seals [B] (Both Sides)
Sleeves [C]
- Apply 2-stroke oil to the threads [D] of the tie-rod bolts.

- Replace the tie-rod nuts [A] with new ones.
- Install the tie-rods with the marked side [B] facing outward.
- Tighten:

Torque - Tie-Rod Nuts: 83 N·m (8.5 kgf·m, 61 ft·lb)

Rocker Arm Removal

- Raise the rear wheel off the ground with a suitable stand or jack.

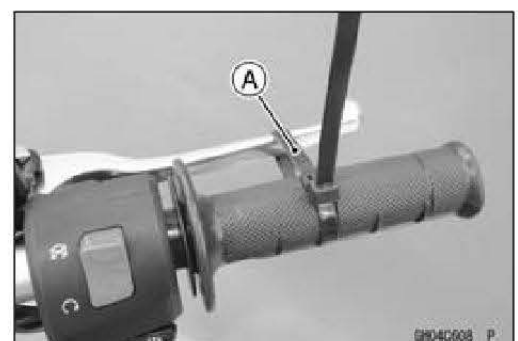
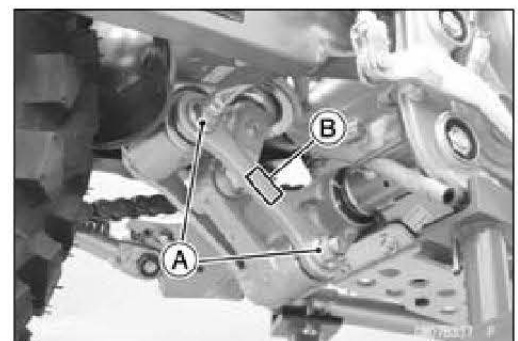
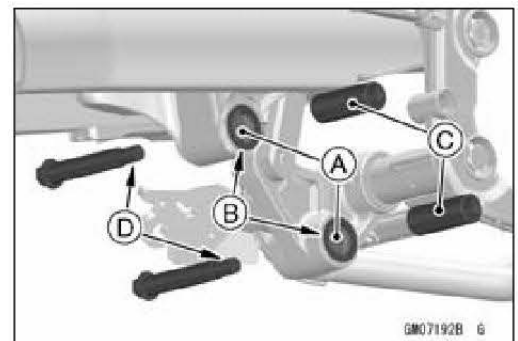
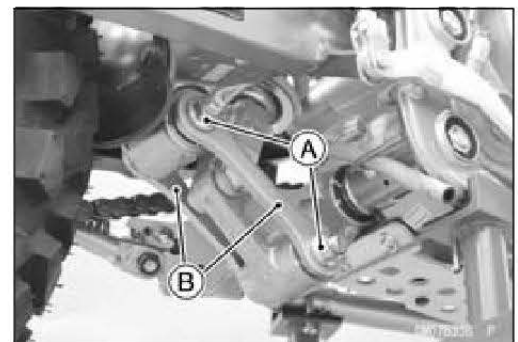
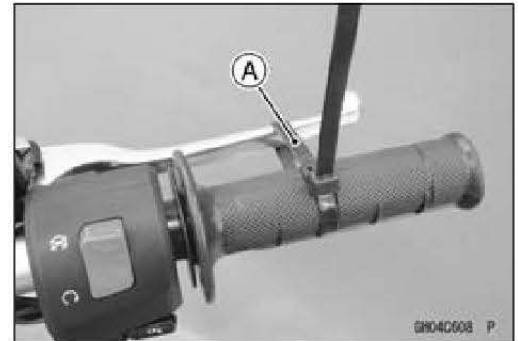
Special Tool - Jack: 57001-1238

- Squeeze the brake lever, and hold it with a band [A] to prevent the motorcycle from running forward.



WARNING

Motorcycle may fall over unexpectedly resulting in an accident or injury. Be sure to hold the front brake when removing the rear wheel.



13-26 SUSPENSION

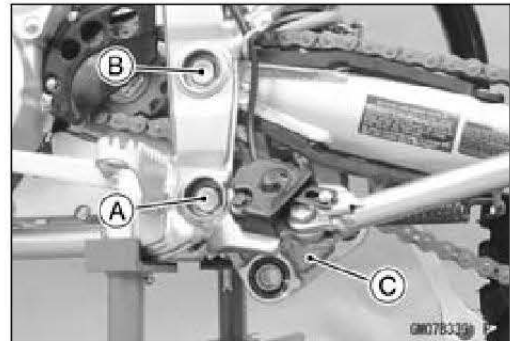
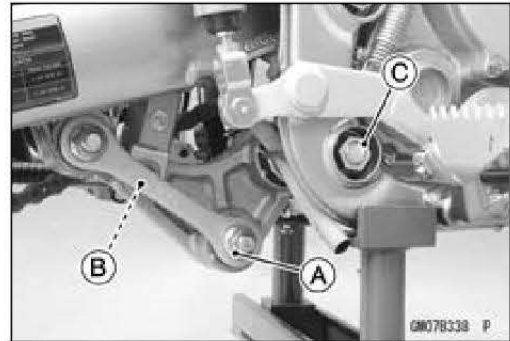
Tie-Rod, Rocker Arm

- Remove:
 - Tie-Rod Bolt and Nut [A] (Front)
 - Rear Shock Absorber Bolt (Lower) [B]
 - Rocker Arm Nut [C] and Shaft

NOTICE

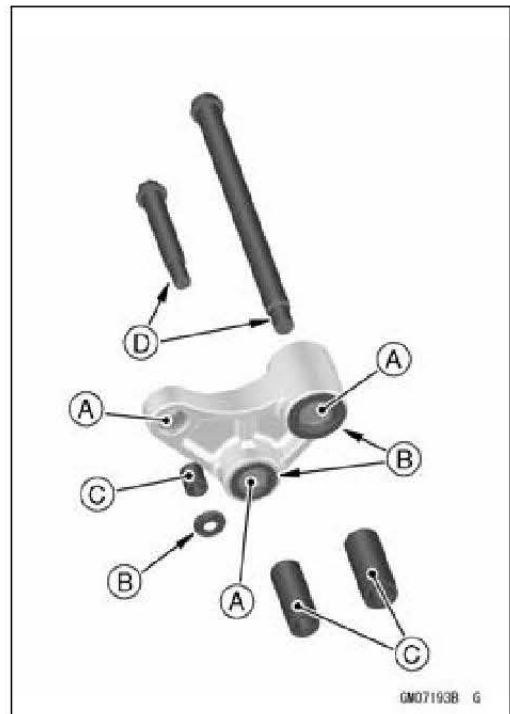
When pulling out the mounting bolt, lift the swingarm wheel slightly. Forcing or tapping on a bolt could damage the bolt, sleeve, and bearing.

- ★ If the rocker arm shaft [A] seems too difficult to remove, loosen the swingarm pivot shaft [B] and nut.
- Remove the rocker arm [C].



Rocker Arm Installation

- Apply grease to the following parts.
 - Needle Bearings [A]
 - Grease Seals [B] (Both Sides)
 - Sleeves [C]
- Apply 2-stroke oil to the threads [D] of the tie-rod bolt and the rocker arm bolt.



- Replace the tie-rod nut with a new one.
- Tighten:
 - Torque - Rocker Arm Nut: 98 N·m (10 kgf·m, 72 ft·lb)
 - Rear Shock Absorber Bolt (Lower): 39 N·m (4.0 kgf·m, 29 ft·lb)
 - Tie-Rod Nut: 83 N·m (8.5 kgf·m, 61 ft·lb)
- Tighten the swingarm pivot shaft nut if loosened.
 - Torque - Swingarm Pivot Shaft Nut: 88 N·m (9.0 kgf·m, 65 ft·lb)

Tie-Rod, Rocker Arm

Tie-Rod and Rocker Arm Bearing Removal

● Remove:

Tie-Rods (see Tie-Rod Removal(13-25))

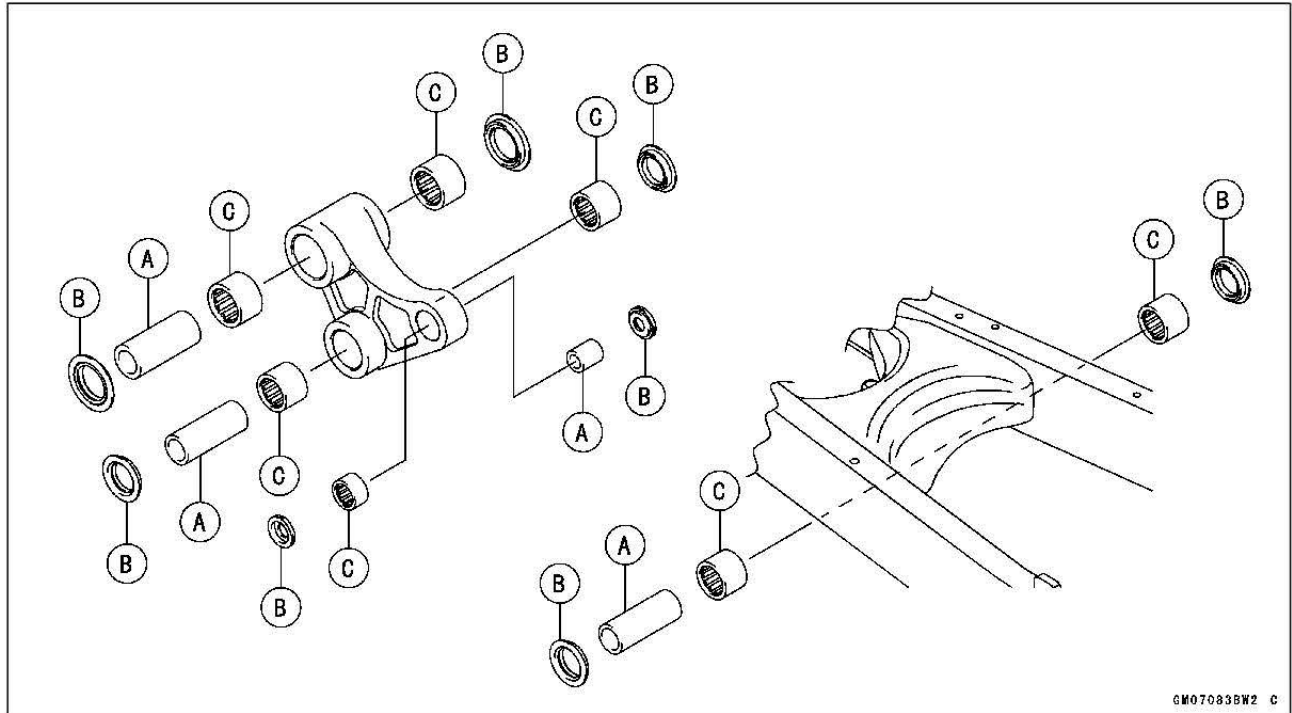
Rocker Arm (see Rocker Arm Removal(13-25))

Swingarm (see Swingarm Removal(13-22))

Sleeves [A]

Grease Seals [B]

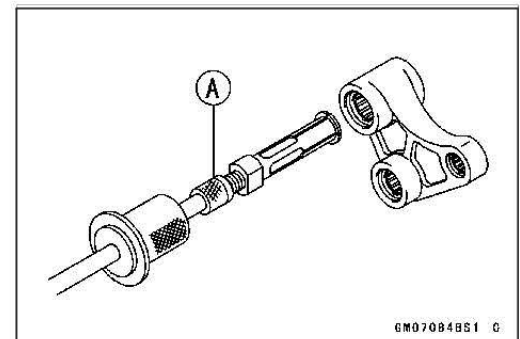
Needle Bearings [C]



○ Remove the rocker arm and tie-rod needle bearings, using the oil seal & bearing remover [A].

Special Tool - Oil Seal & Bearing Remover: 57001-1058

○ Remove the lower rear shockabsorber needle bearing, using the available remover.



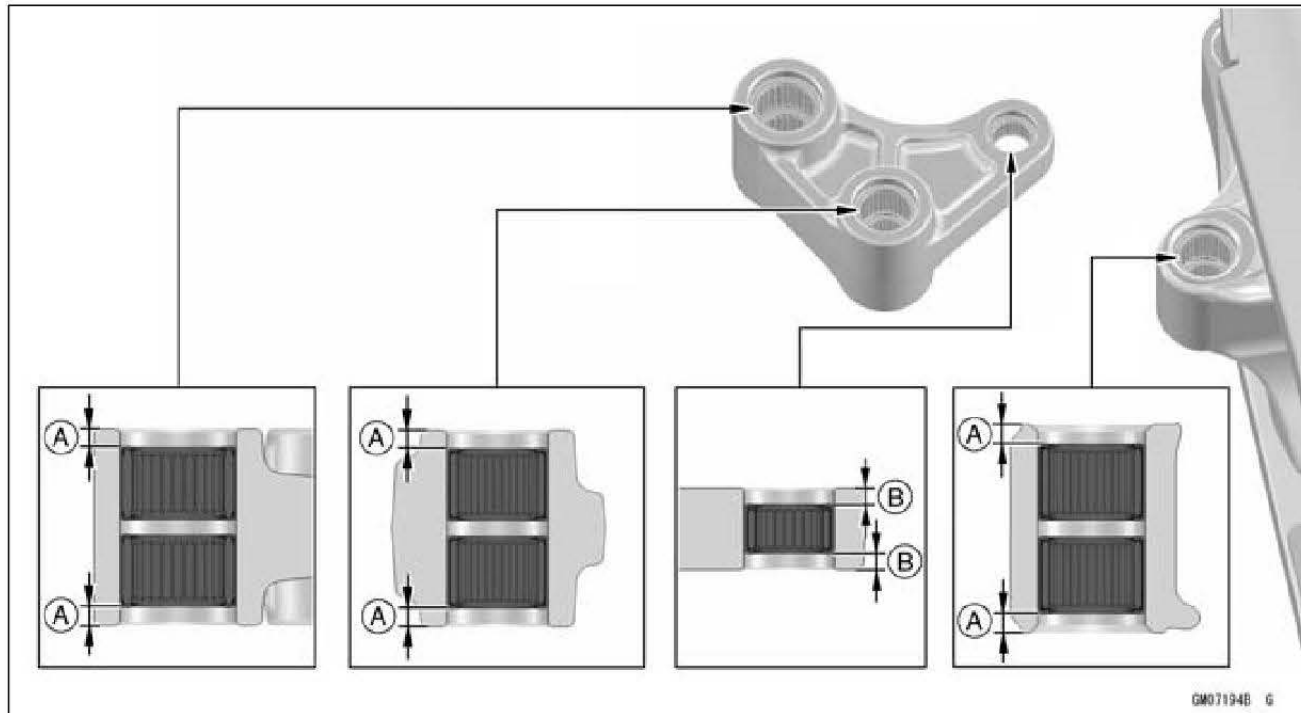
13-28 SUSPENSION

Tie-Rod, Rocker Arm

Tie-Rod and Rocker Arm Bearing Installation

- Replace the needle bearings with new ones.
 - Apply plenty of grease to the needle bearings.
 - Install the needle bearings to the specified position.
 - 5.0 mm (0.20 in.) [A]
 - 4.0 mm (0.22 in.) [B]
- Use a suitable bearing driver and the bearing driver set.

Special Tool - Bearing Driver Set: 57001-1129



- Install the removed parts.

Rocker Arm Sleeve Inspection

- Remove the rocker arm (see [Rocker Arm Removal\(13-25\)](#)).
- Pull the sleeves off the rocker arm and the swingarm.
- Measure the outside diameter of each sleeve.

Sleeve Outside Diameter

Standard:

Large [A] 24.987 ~ 25.000 mm (0.98374 ~ 0.98425 in.)

Middle [B] 21.987 ~ 22.000 mm (0.86563 ~ 0.86614 in.)

Small [C] 15.989 ~ 16.000 mm (0.62949 ~ 0.62992 in.)

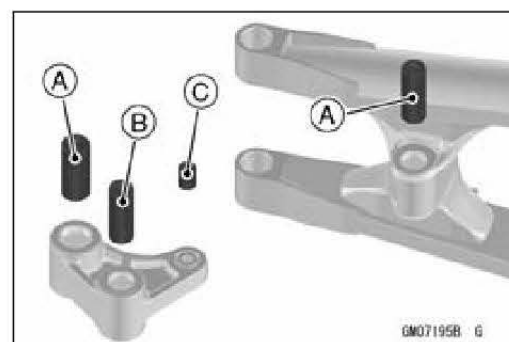
Service Limit:

Large 24.85 mm (0.9783 in.)

Middle 21.85 mm (0.8602 in.)

Small 15.85 mm (0.6240 in.)

- ★ If the sleeve is worn down to less than the service limit, replace it.



Tie-Rod, Rocker Arm

Needle Bearing Inspection

NOTICE

Do not remove the bearings for inspection. Removal may damage them.

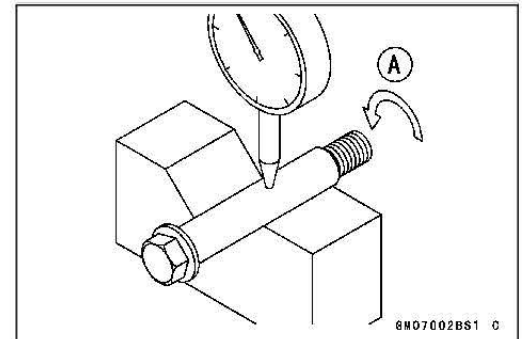
- Inspect the needle bearings installed in the rocker arm.
- The needle bearing normally wear very little, and wear is difficult to measure. Instead of measuring, visually inspect the bearings for abrasion, discoloration, or other damage.
- ★ If the needle bearing show any sings of abnormal wear, discoloration, or damage, replace it.

Rocker Arm Bolt Bent Inspection

NOTE

○ A bent bolt causes vibration, poor handling, and instability.

- To measure the bolt runout, remove the bolt, place it in V blocks, and set a dial gauge to the bolt at a point halfway between the blocks. Turn [A] the bolt to measure the runout. The amount of dial variation is the amount of runout.



Rocker Arm Bolt Runout

Standard: TIR 0.1 mm (0.004 in.) or less

Service Limit: TIR 0.2 mm (0.008 in.)

- ★ If any measurement exceeds the service limit, replace the bolt.

Steering

Table of Contents

Exploded View.....	14-2
Special Tools	14-4
Steering	14-5
Steering Inspection	14-5
Steering Adjustment.....	14-5
Steering Stem.....	14-6
Steering Stem, Stem Bearing Removal	14-6
Steering Stem, Stem Bearing Installation	14-8
Stem Bearing Lubrication.....	14-10
Stem Bearing Wear, Damage Inspection.....	14-10
Steering Stem Warp Inspection	14-10
Stem Cap Deterioration, Damage Inspection	14-11
Handlebar	14-12
Handlebar Removal	14-12
Handlebar Installation	14-13

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Handlebar Clamp Bolts	25	2.5	18	S
2	Switch Housing Screws	3.5	0.36	31 in·lb	
3	Steering Stem Head Nut	44	4.5	32	
4	Steering Stem Nut	4.9	0.50	43 in·lb	

5. KLX300E

AD: Apply adhesive cement.

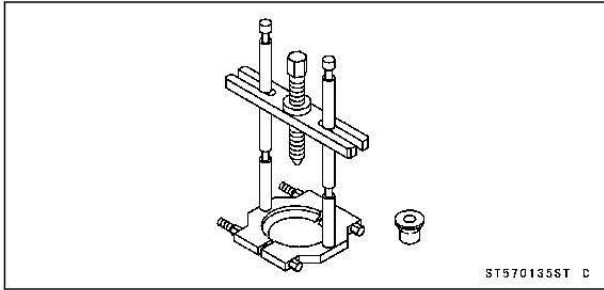
G: Apply grease.

S: Follow the specified tightening sequence.

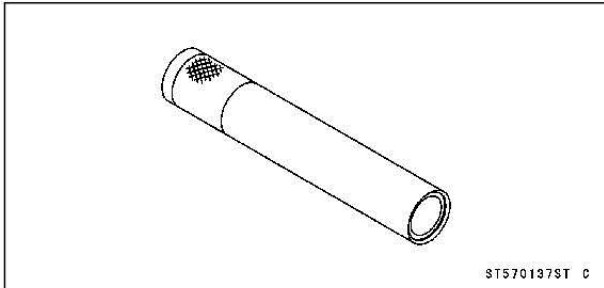
14-4 STEERING

Special Tools

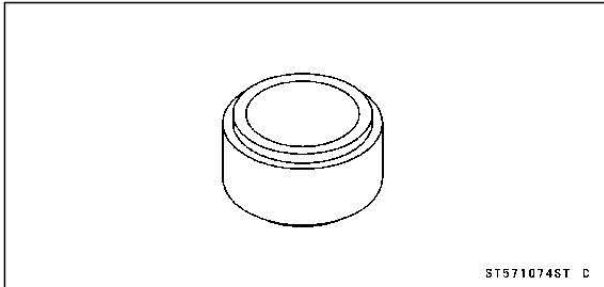
Bearing Puller:
57001-135



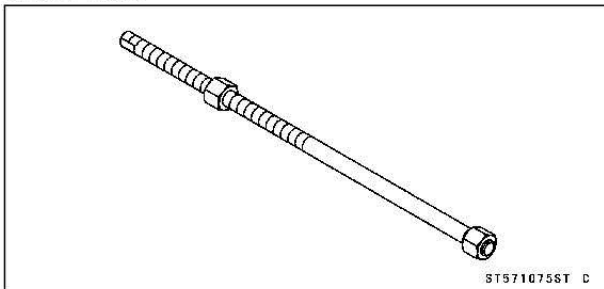
Steering Stem Bearing Driver:
57001-137



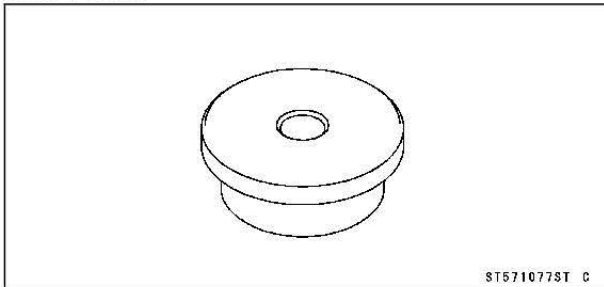
Steering Stem Bearing Driver Adapter, $\phi 34.5$:
57001-1074



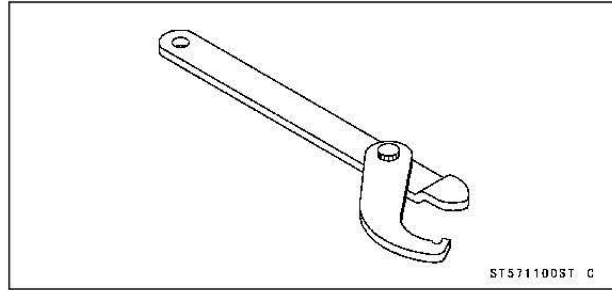
Head Pipe Outer Race Press Shaft:
57001-1075



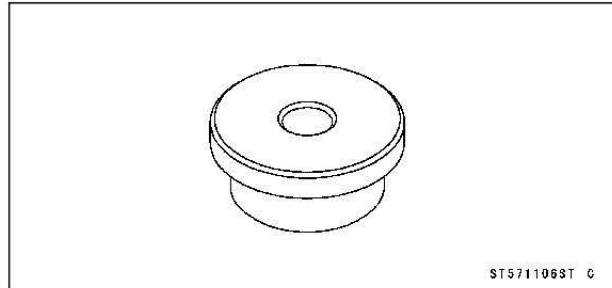
Head Pipe Outer Race Driver, $\phi 54.5$:
57001-1077



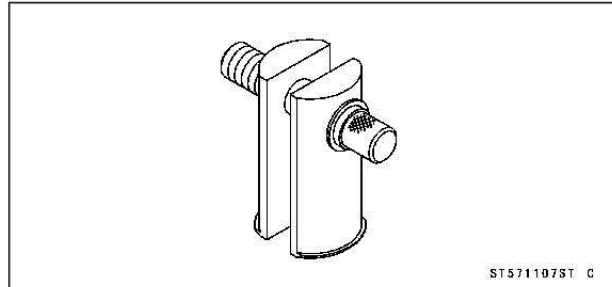
Steering Stem Nut Wrench:
57001-1100



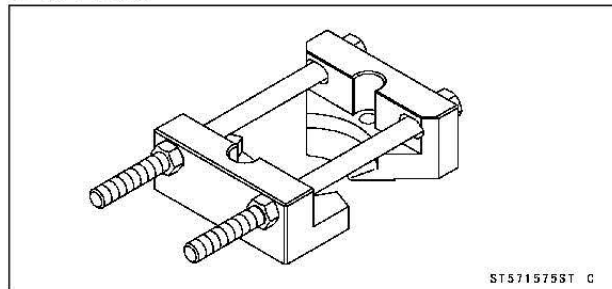
Head Pipe Outer Race Driver, $\phi 46.5$:
57001-1106



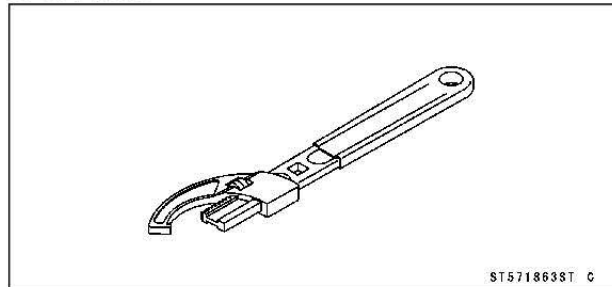
Head Pipe Outer Race Remover ID > 37 mm:
57001-1107



Bearing Puller:
57001-1575



Adjustable Hook Wrench:
57001-1863



Steering

Steering Inspection

- Refer to the Steering Play Inspection (see Steering Play Inspection(2-53)).

Steering Adjustment

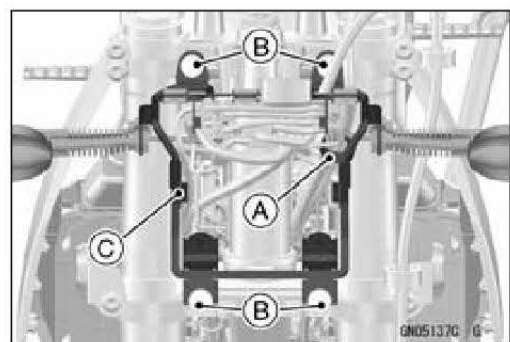
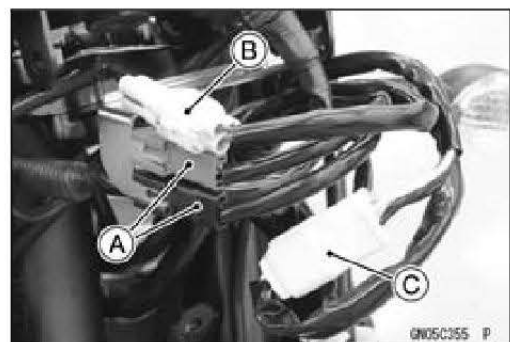
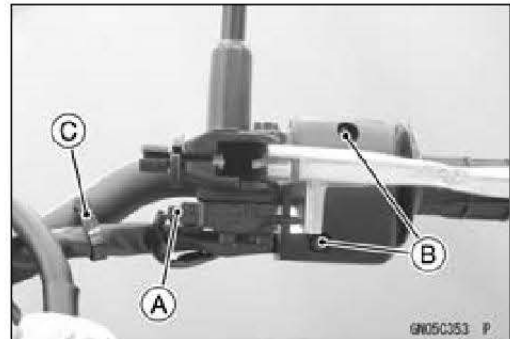
- Refer to the Steering Play Adjustment (see Steering Play Adjustment(2-53)).

14-6 STEERING

Steering Stem

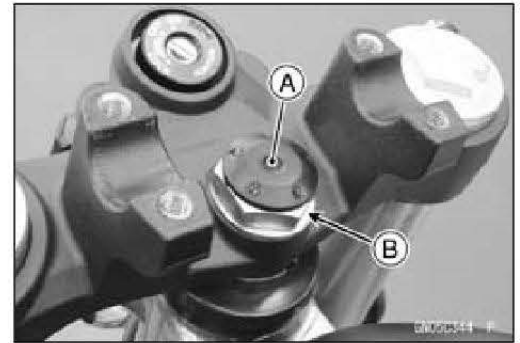
Steering Stem, Stem Bearing Removal

- Remove:
 - Front Fender ([see Front Fender Removal\(15-11\)](#))
 - Headlight ([see Headlight Removal\(16-52\)](#))
 - Meter Unit ([see Meter Unit Removal\(16-65\)](#))
 - Disconnect:
 - Clutch Cable Upper End ([see Clutch Cable Removal\(6-6\)](#))
 - Starter Lockout Switch Connector [A]
 - Remove:
 - Left Switch Housing Screws [B]
 - Open:
 - Clamp [C]
-
- Disconnect:
 - Throttle Cable Upper Ends ([see Throttle Cable Replacement\(3-106\)](#))
 - Front Brake Light Switch Connectors [A]
 - Open:
 - Clamp [B]
-
- Disconnect:
 - Front Turn Signal Light Lead Connectors [A]
 - Ignition Switch Lead Connector [B]
 - Speed Sensor Lead Connector [C]
-
- Remove:
 - Band [A]
 - Bolts [B]
 - Headlight Bracket [C]

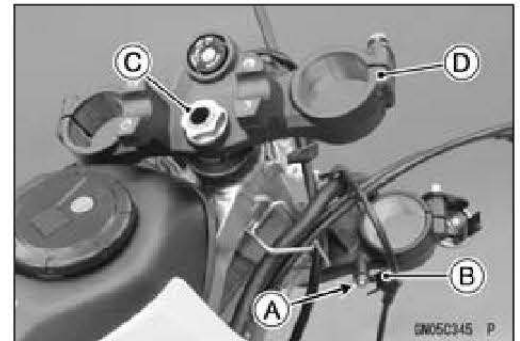


Steering Stem

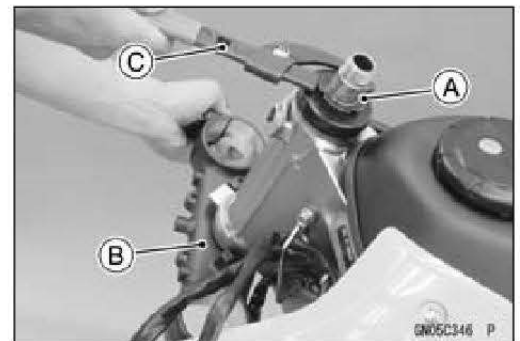
- Remove the handlebars from the steering stem head (see [Handlebar Removal\(14-12\)](#)).
- Put the handlebars on the suitable stand.
- Remove:
Cap [A]
- Loosen:
Steering Stem Head Nut [B]



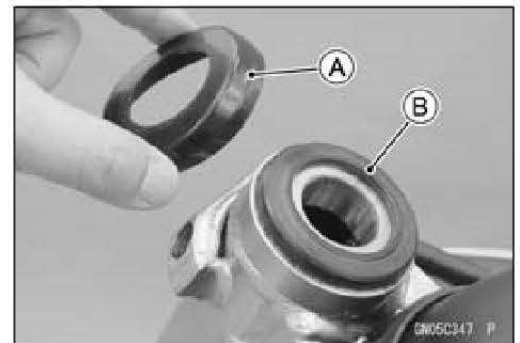
- Remove:
Front Fork (see [Front Fork Removal\(13-9\)](#))
Bolt [A]
Bracket [B]
Steering Stem Head Nut [C] and Washer
Steering Stem Head [D]



- Remove:
Steering Stem Nut [A]
Steering Stem [B]
- Special Tool - Steering Stem Nut Wrench: 57001-1100 or Adjustable Hook Wrench [C]: 57001-1863**



- Remove:
Cap [A]
Tapered Roller Bearing [B]

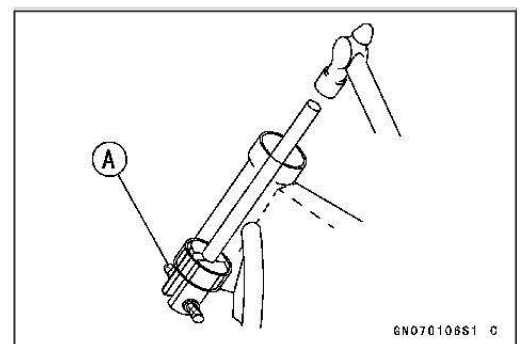


- Drive out the bearing outer races from the head pipe.
- Install the remover to the inside of the head pipe outer race, and hammer it to drive the outer race out.

Special Tool - Head Pipe Outer Race Remover ID>37 mm [A]: 57001-1107

NOTE

- If either steering stem bearing is damaged, it is recommended that both the upper and lower bearings (including outer races) should be replaced with new ones.



14-8 STEERING

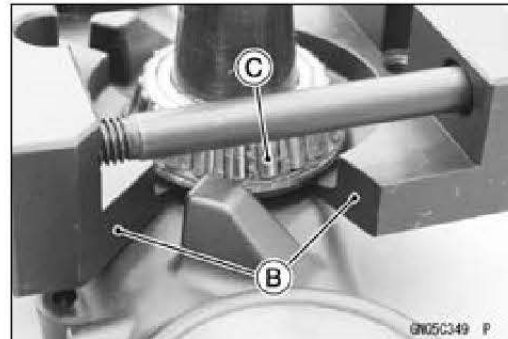
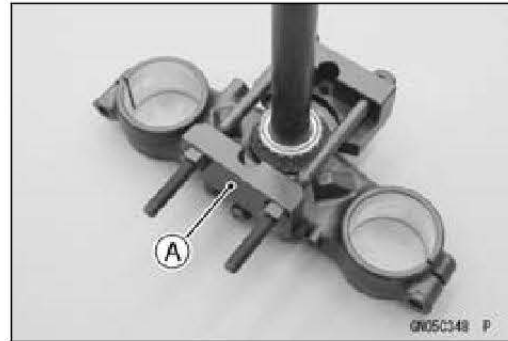
Steering Stem

- Install the bearing puller [A] to the steering stem.
- Insert the two bases [B] under the bottom of the tapered roller bearing [C], and hold them using the bolts and nuts.

Special Tool - Bearing Puller: 57001-1575

NOTE

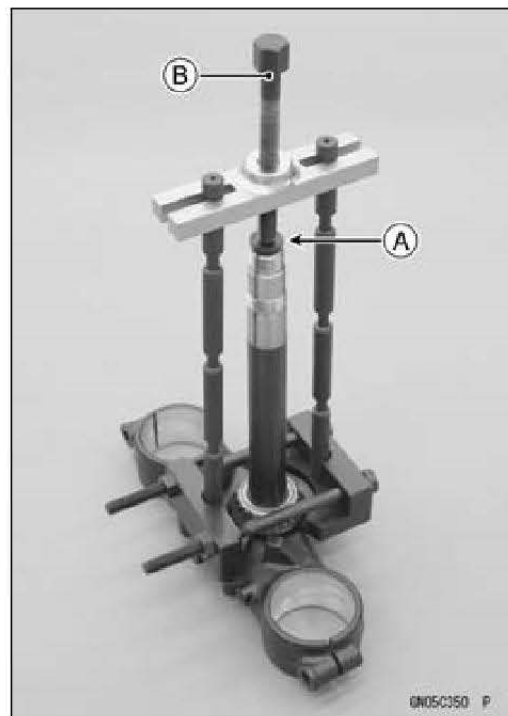
- Tighten evenly two bases by the two bolts.



- Assemble the bearing puller (57001-135) on the bearing puller (57001-1575) as shown.
Adapter [A]

Special Tool - Bearing Puller: 57001-135

- Turning in the center bolt [B], pull up the tapered roller bearing.



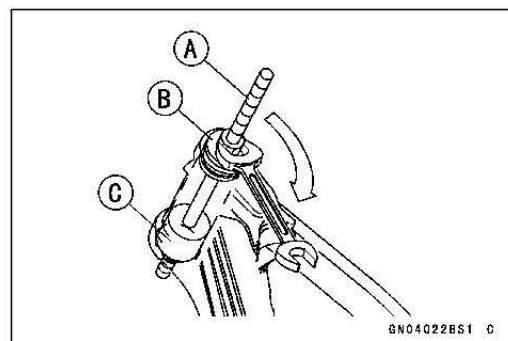
Steering Stem, Stem Bearing Installation

- Replace the bearing outer race with new ones.
- Apply grease to the outer races.
- Drive the outer races into the head pipe at the same time with the special tools.

Special Tools - Head Pipe Outer Race Press Shaft [A]: 57001-1075

Head Pipe Outer Race Driver, $\phi 46.5$ [B]: 57001-1106

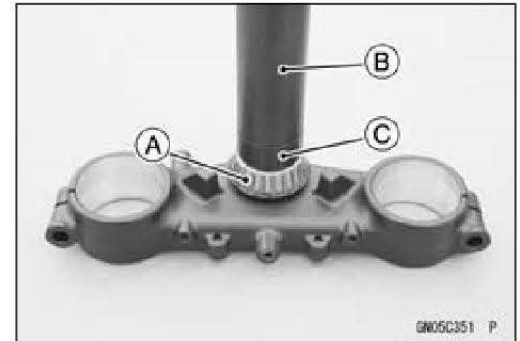
Head Pipe Outer Race Driver, $\phi 54.5$ [C]: 57001-1077



Steering Stem

- Replace the inner races with new ones.
- Apply grease to the lower tapered roller bearing [A], and drive it onto the stem with the steering stem bearing driver [B] and adapter [C].

Special Tools - Steering Stem Bearing Driver: 57001-137
Steering Stem Bearing Driver Adapter, $\phi 34.5$: 57001-1074



- Apply grease to the upper tapered roller bearing, and install it in the head pipe.
- Install the stem through the head pipe and upper bearing, and hand-tighten the stem nut while pushing up the stem base.
- Install the steering stem nut with stepped side facing down.
- Install the stem head and washer, and tighten the stem head nut lightly.
- Settle the bearing in place as follows;
- Tighten the stem nut to **35 N·m (3.6 kgf·m, 26 ft·lb)** of torque (To tighten the steering stem nut to the specified torque, hook the wrench [A] on the stem nut, and pull the wrench at the hole by **194 N (19.8 kgf)** force [B] in the direction shown.).

Special Tool - Steering Stem Nut Wrench: 57001-1100 or Adjustable Hook Wrench: 57001-1863

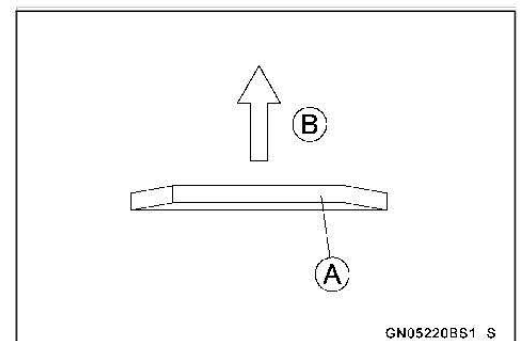
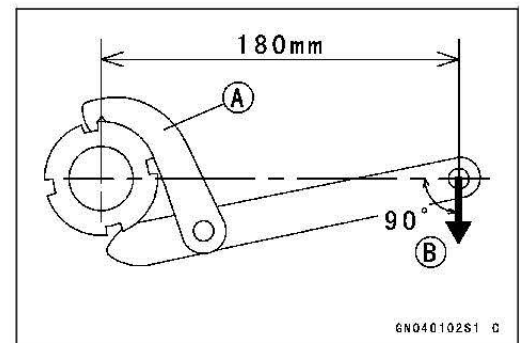
- Check that there is no play and the steering stem turns smoothly without rattles. If not, the steering stem bearings may be damaged.
- Again back out the stem nut a fraction of a turn until it turns lightly.
- Turn the stem nut lightly clockwise until it just becomes hard to turn. Do not overtighten, or the steering will be too tight.

Torque - Steering Stem Nut: 4.9 N·m (0.50 kgf·m, 43 in·lb)

- Install the stem head.
- Install the washer, and tighten the stem head nut temporarily.
- Turn the convex side of the washer [A] to the upside [B].
- Install the front forks (see Front Fork Installation(13-10)).

NOTE

- Tighten the fork clamp bolts (upper) first, next the stem head nut, last the fork clamp bolt (lower).



14-10 STEERING

Steering Stem

- Tighten:

Torque - Upper Front Fork Clamp Bolts: 20 N·m (2.0 kgf·m, 15 ft·lb)

Steering Stem Head Nut: 44 N·m (4.5 kgf·m, 32 ft·lb)

Lower Front Fork Clamp Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)

NOTE

○ Tighten the two clamp bolts alternately two times to ensure even tightening torque.

- Install the removed parts.



WARNING

If the handlebar does not turn to the steering stop it may cause an accident resulting in injury or death. Be sure the cables, harnesses and hoses are routed properly and do not interfere with handlebar movement (see Cable, Wire, and Hose Routing section (17-2)).

- Check and Adjust:

Steering (see Steering Play Inspection(2-53))

Front Brake (see Brake Operation Inspection(2-42))

Clutch Cable (see Clutch Operation Inspection (2-33))

Throttle Cable (see Throttle Control System Inspection(2-18))

Stem Bearing Lubrication

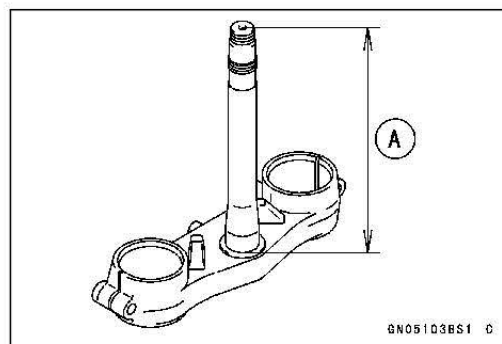
- Refer to the Steering Stem Bearing Lubrication (see Steering Stem Bearing Lubrication(2-55)).

Stem Bearing Wear, Damage Inspection

- Using a high flash-point solvent, wash the upper and lower tapered rollers.
- Visually check the outer race and the rollers.
- ★ Replace the bearing assembly if it show damage.

Steering Stem Warp Inspection

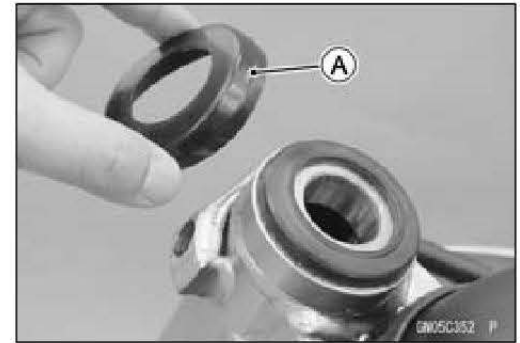
- Whenever the steering stem is removed, or if the steering movement is not smooth, check the steering stem for straightness.
- ★ If the steering stem [A] is bent, replace the steering stem.



Steering Stem

Stem Cap Deterioration, Damage Inspection

- Whenever the steering stem is removed, or if the steering movement is not smooth, check the stem cap [A] for damage.
- ★ Replace the stem cap if it shows damage.

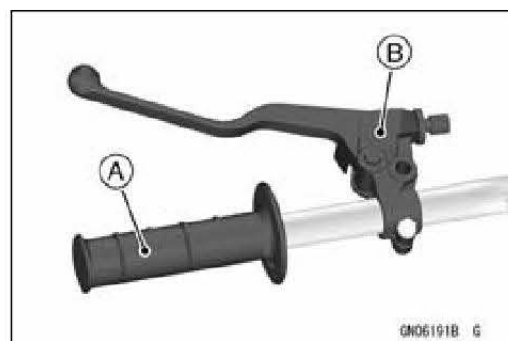
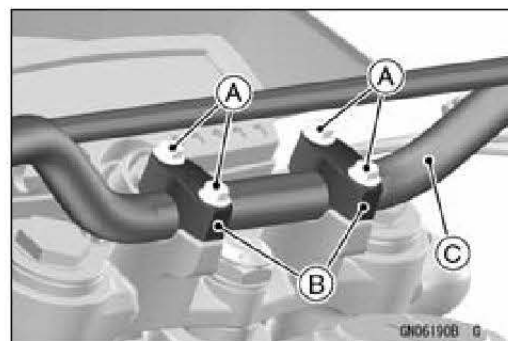
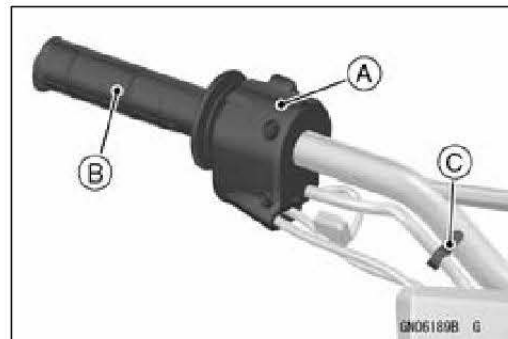
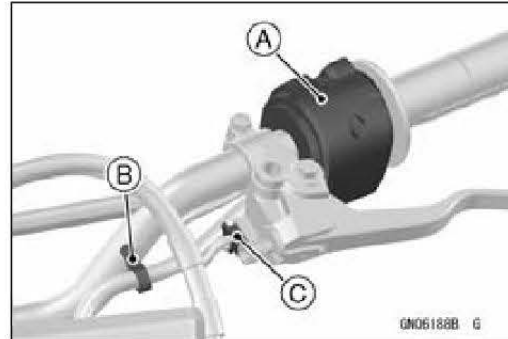


14-12 STEERING

Handlebar

Handlebar Removal

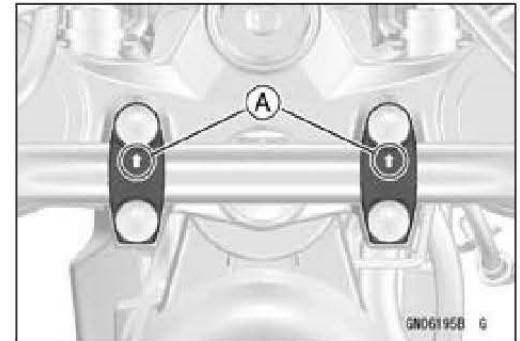
- Remove:
 - Rear View Mirror (see [Rear View Mirror Removal\(15-21\)](#))
 - Clutch Cable Upper End (see [Clutch Cable Removal\(6-6\)](#))
 - Front Master Cylinder (see [Front Master Cylinder Removal\(12-18\)](#))
 - Remove:
 - Left Switch Housing [A]
 - Open:
 - Clamp [B]
 - Disconnect:
 - Starter Lockout Switch Connector [C]
-
- Remove:
 - Right Switch Housing [A]
 - Throttle Grip [B]
 - Open:
 - Clamp [C]
-
- Remove:
 - Handlebar Clamp Bolts [A]
 - Handlebar Clamps [B]
 - Handlebars [C]
-
- Remove the followings if necessary.
 - Left Handlebar Grip [A]
 - Clutch Lever Assembly [B]



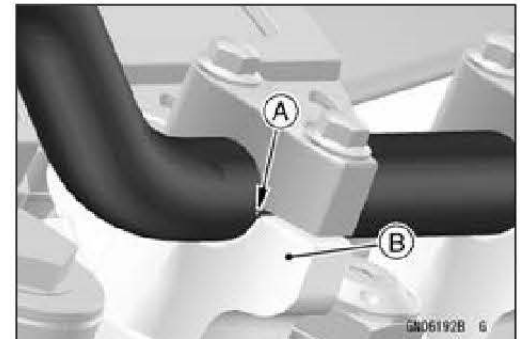
Handlebar

Handlebar Installation

- Install the clutch lever assembly if it removed (see Clutch Lever Assembly Installation(6-7)).
- Install the handlebar clamps.
- Point the arrow marks [A] forward.

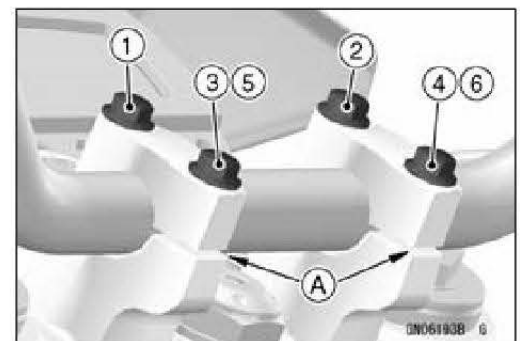


- Align the punch mark [A] on the handlebars with the corner edge of the steering stem head [B].



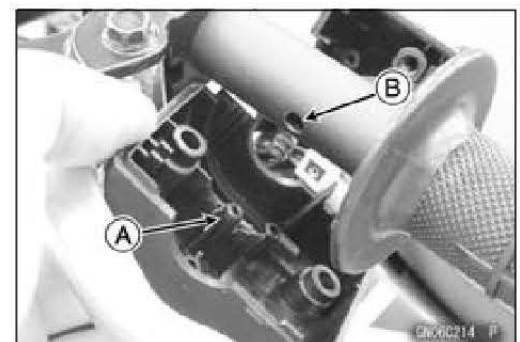
- Tighten the handlebar clamp bolts following the specified tightening sequence [1 ~ 6].
- There will be a gap [A] at the rear part of the handlebar clamp after tightening.

Torque - Handlebar Clamp Bolts: 25 N·m (2.5 kgf·m, 18 ft·lb)



- Install the left switch housing.
- Fit the projection [A] to the hole [B] on the handlebars.
- Run the leads correctly (see Cable, Wire, and Hose Routing section (17-2)).
- Tighten:

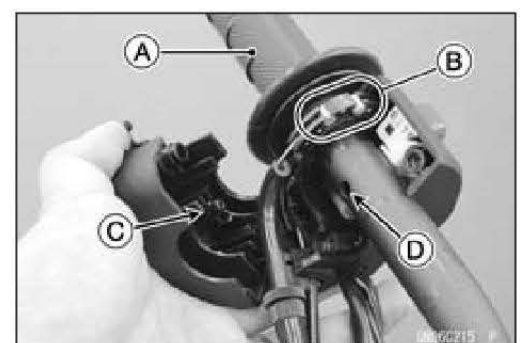
Torque - Switch Housing Screws: 3.5 N·m (0.36 kgf·m, 31 in·lb)



- Install:
 - Throttle Grip [A]
 - Throttle Cable Tips [B]
 - Right Switch Housing
- Fit the projection [C] to the hole [D] on the handlebars.
- Run the leads and cables correctly (see Cable, Wire, and Hose Routing section (17-2)).

Torque - Switch Housing Screws: 3.5 N·m (0.36 kgf·m, 31 in·lb)

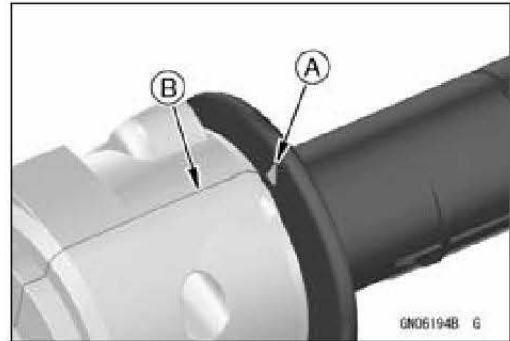
- Install the removed parts.



14-14 STEERING

Handlebar

- ★ If the left handlebar grip is removed, install it according to the following steps.
- Using a high flash-point solvent, clean off any oil or dirt that may be on the adhesive coating area. Dry them with a clean cloth.
- Apply adhesive to the left handlebar.
- Install the grip until it is bottomed.
- Rotate the grip to spread adhesive.
- Align the triangle mark [A] on the left handlebar grip with the mating surface [B] of the left switch housing.
- Wipe off any excess adhesive.



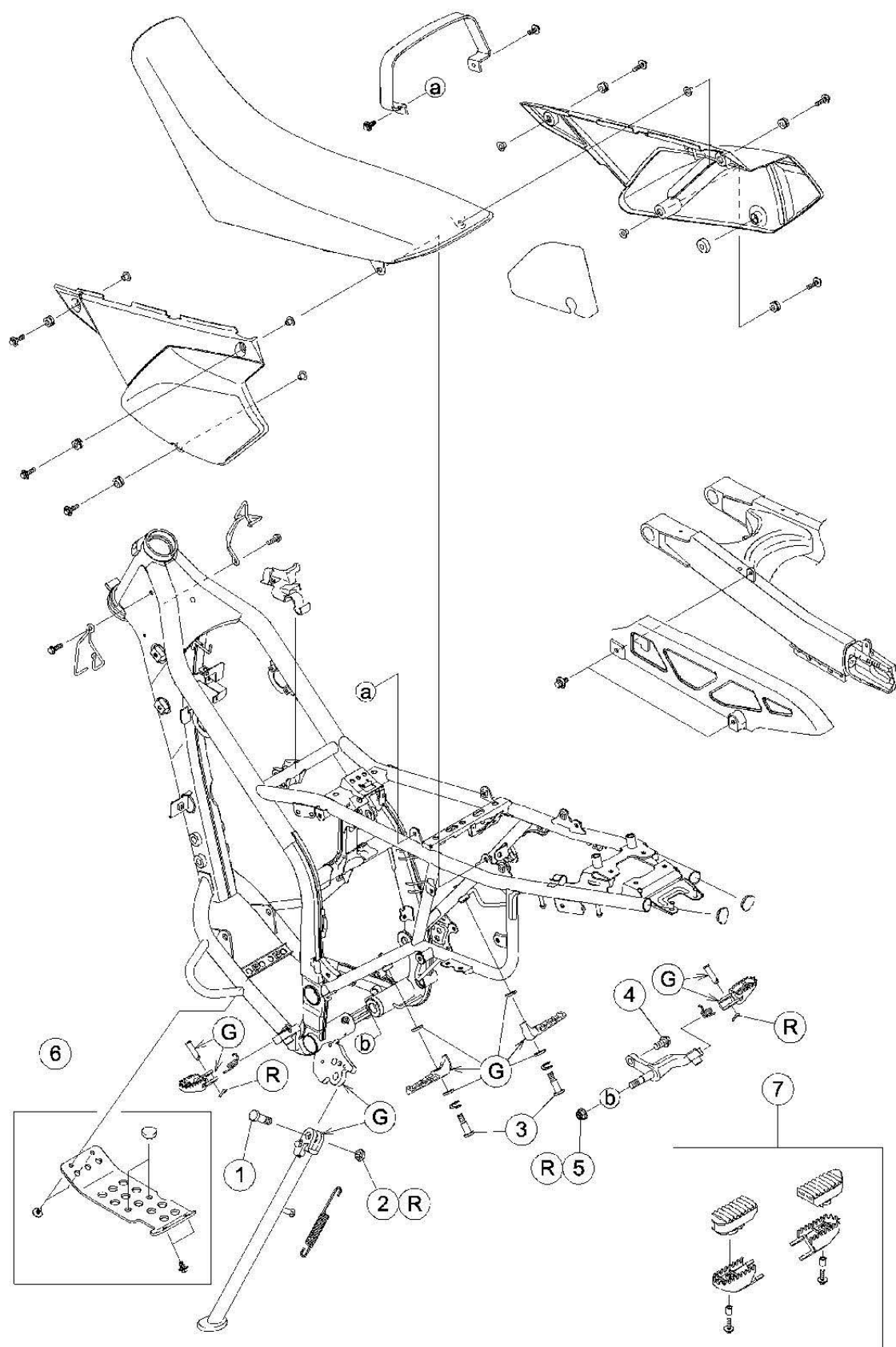
Frame

Table of Contents

Exploded View.....	15-2
Special Tool.....	15-6
Seat.....	15-7
Seat Removal	15-7
Seat Installation	15-7
Covers.....	15-8
Side Cover Removal.....	15-8
Side Cover Installation.....	15-8
Rear Frame Cover Removal.....	15-8
Rear Frame Cover Installation.....	15-9
Shroud.....	15-10
Shroud Removal	15-10
Shroud Installation	15-10
Fender.....	15-11
Front Fender Removal.....	15-11
Front Fender Installation.....	15-11
Rear Fender Removal.....	15-11
Rear Fender Installation.....	15-12
Flap Removal.....	15-12
Flap Installation.....	15-13
Flap Disassembly.....	15-13
Flap Assembly	15-14
Frame.....	15-15
Frame Inspection	15-15
Battery Case.....	15-16
Battery Case Removal.....	15-16
Battery Case Installation.....	15-16
Footpegs.....	15-17
Front Footpeg Removal.....	15-17
Front Footpeg Installation.....	15-17
Rear Footpeg Removal.....	15-18
Rear Footpeg Installation.....	15-18
Guard.....	15-19
Engine Guard Removal.....	15-19
Engine Guard Installation.....	15-19
Mud Guard Removal.....	15-19
Mud Guard Installation.....	15-19
Side Stand.....	15-20
Side Stand Removal	15-20
Side Stand Installation	15-20
Rear View Mirrors.....	15-21
Rear View Mirror Removal.....	15-21
Rear View Mirror Installation.....	15-21

15-2 FRAME

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Side Stand Bolt	30	3.1	22	
2	Side Stand Nut	44	4.5	32	R
3	Rear Footpeg Pivot Bolts	25	2.5	18	
4	Front Footpeg Bracket Bolt	39	4.0	29	
5	Front Footpeg Bracket Nut	39	4.0	29	R

6. KLX300D

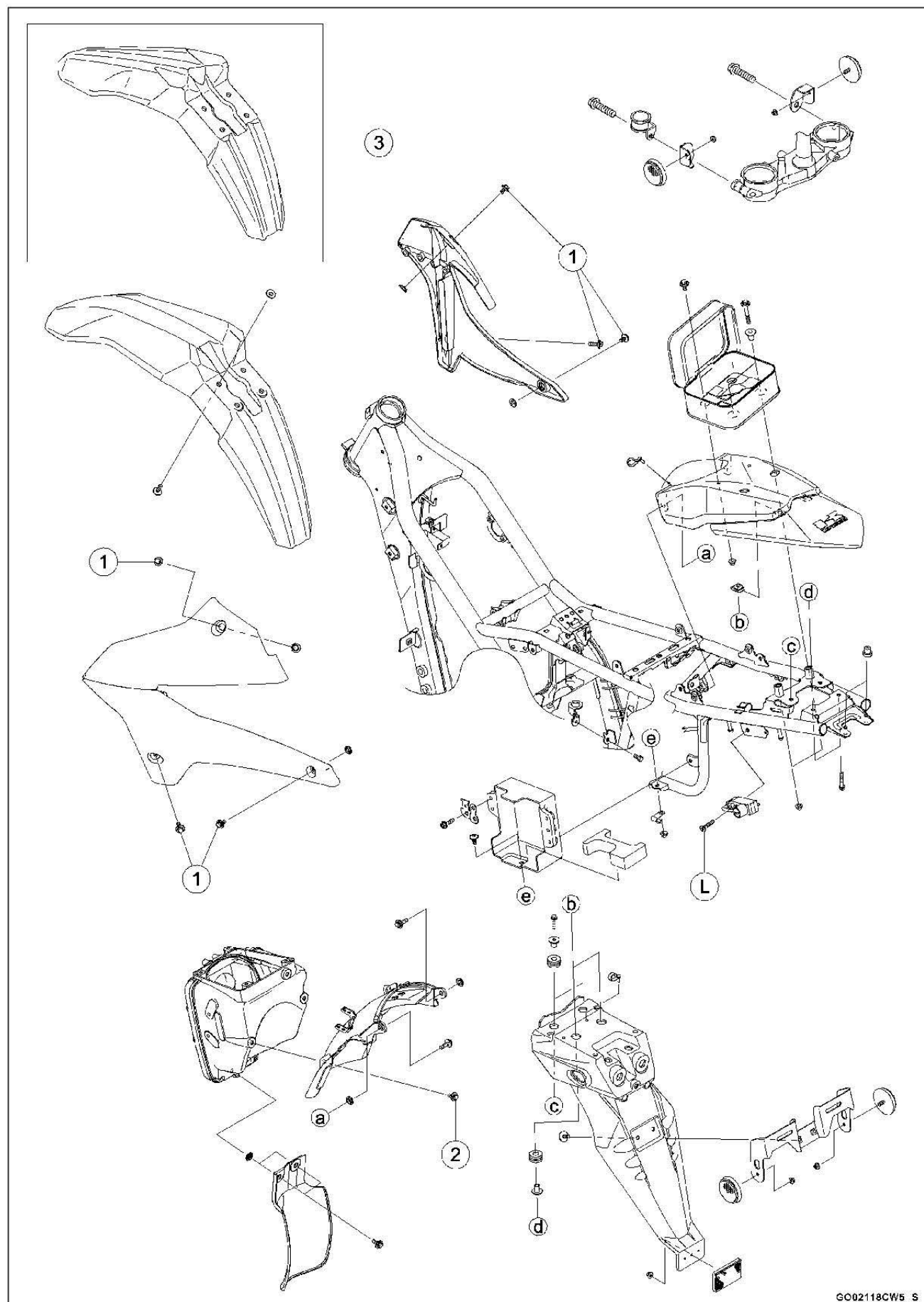
7. KLX300E

G: Apply grease.

R: Replacement Parts

15-4 FRAME

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Shroud Bolts	6.9	0.70	61 in·lb	
2	Rear Fender Bolts	6.9	0.70	61 in·lb	

3. KLX300E

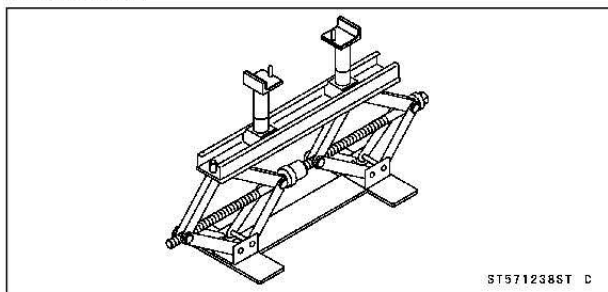
L: Apply a non-permanent locking agent.

15-6 FRAME

Special Tool

Jack:

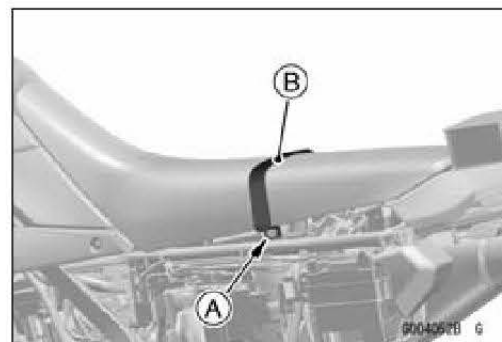
57001-1238



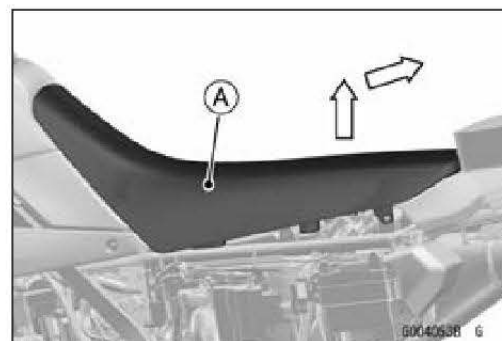
Seat

Seat Removal

- Remove:
 - Side Covers (see Side Cover Removal(15-8))
- Remove the bolt [A] to free the seat strap [B].

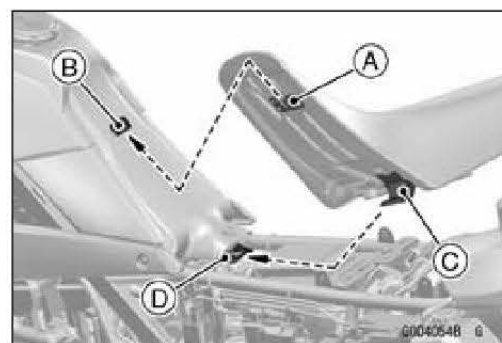


- Remove the seat [A] backward while lifting up the rear part of the seat.



Seat Installation

- Insert the front hook [A] to the receiver [B] on the fuel tank.
- Insert the center hook [C] under the frame [D].
- Install the removed parts.

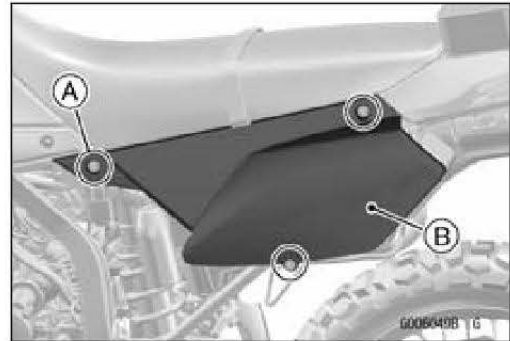


15-8 FRAME

Covers

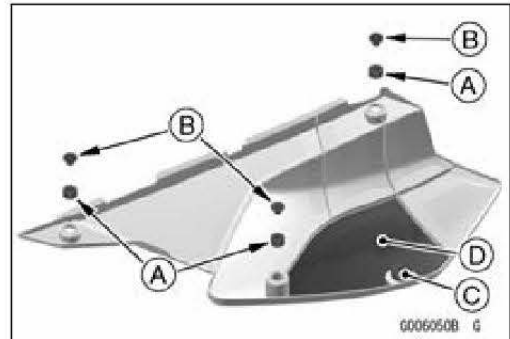
Side Cover Removal

- Remove:
 - Bolts [A]
 - Left Side Cover [B]
- The same way applies for removing the right side cover.



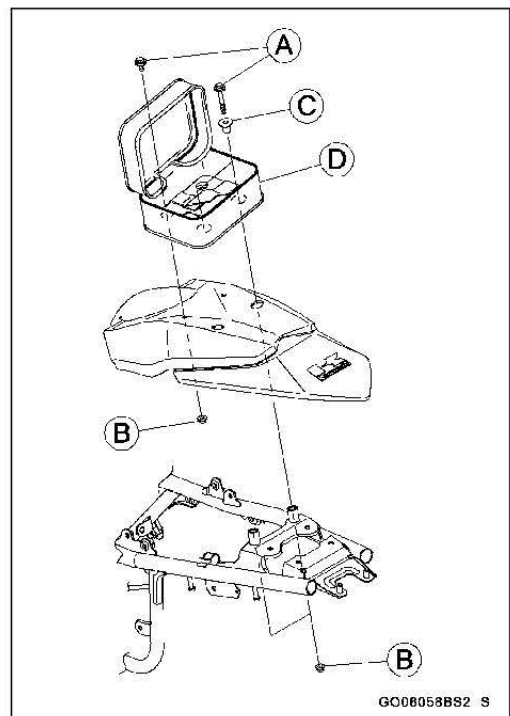
Side Cover Installation

- Installation is the reverse of removal.
- The dampers [A] have no direction.
- Install the collars [B] from the inside of the side cover.
- There are the damper [C] and the pads [D] on the right side only.

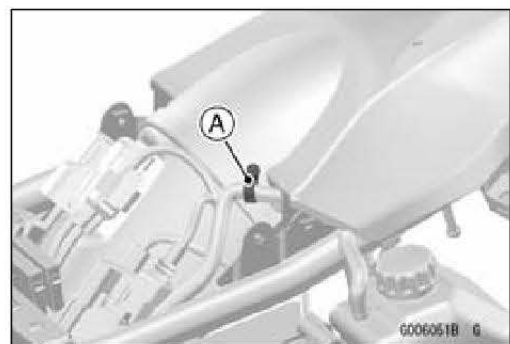


Rear Frame Cover Removal

- Remove:
 - Side Covers (see Side Cover Removal(15-8))
 - Seat (see Seat Removal (15-7))
 - Bolts [A] and Nuts [B]
 - Collars [C]
 - Tool Kit Bag [D]

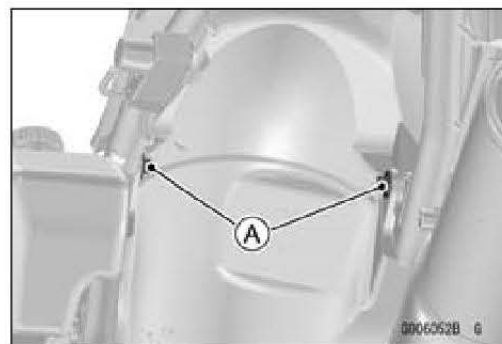


- Open:
 - Clamp [A]

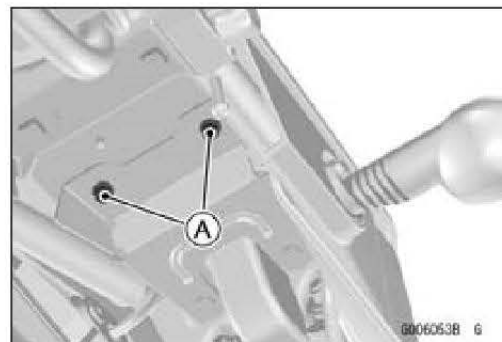


Covers

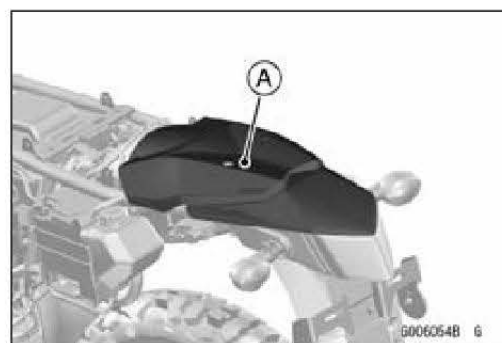
- Remove:
Bolts [A]



- Remove:
Bolts [A]

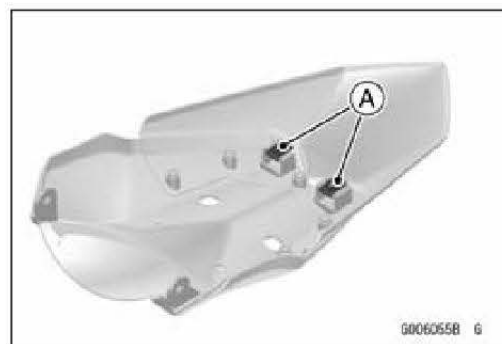


- Remove:
Rear Frame Cover [A]



Rear Frame Cover Installation

- Installation is the reverse of removal.
- Check that the clip nuts [A] are in place.

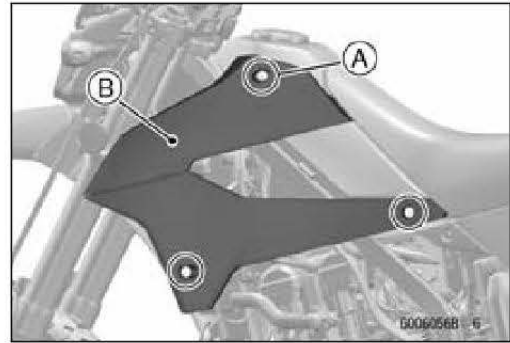


15-10 FRAME

Shroud

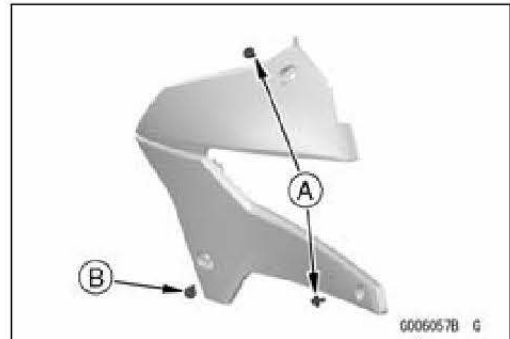
Shroud Removal

- Remove:
 - Shroud Bolts [A]
 - Shroud [B]



Shroud Installation

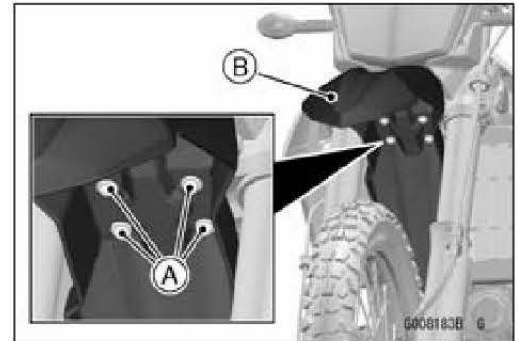
- Install the shroud and the shroud bolts.
- The bolt lengths are as follows.
 - L = 12 mm (0.47 in.) [A]
 - L = 20 mm (0.79 in.) [B]
- Tighten:
 - Torque - Shroud Bolts: 6.9 N·m (0.70 kgf·m, 61 in·lb)**



Fender

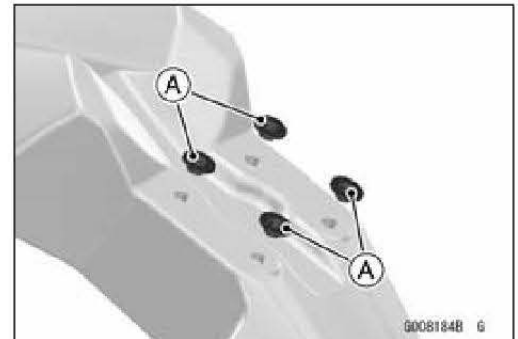
Front Fender Removal

- Remove:
 - Bolts [A]
 - Front Fender [B]



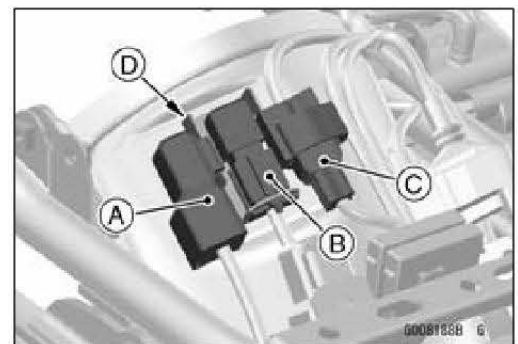
Front Fender Installation

- Installation is the reverse of removal.
- Check that the collars [A] are in place.

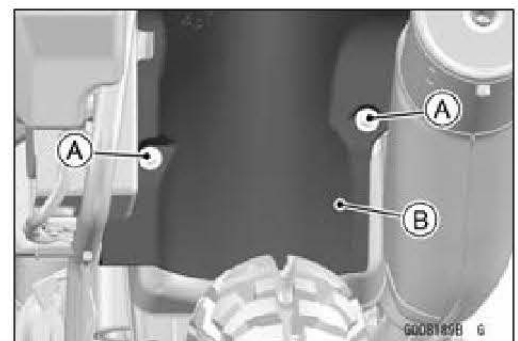


Rear Fender Removal

- Remove:
 - Side Covers (see Side Cover Removal(15-8))
 - Seat (see Seat Removal (15-7))
 - Rear Frame Cover (see Rear Frame Cover Removal(15-8))
 - Starter Relay (see Starter Relay Removal(16-49))
- Remove the starter circuit relay [A], interlock diode unit [B] and the oxygen sensor connector [C] from the bracket [D].



- Remove:
 - Rear Fender Bolts [A]
 - Rear Fender [B]

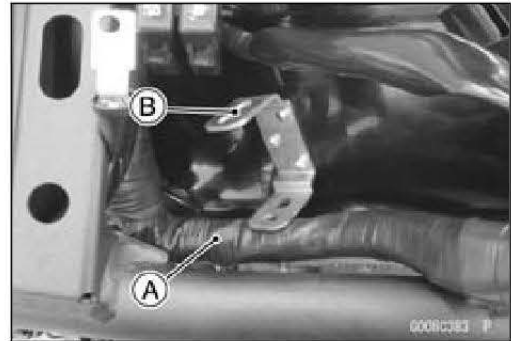


15-12 FRAME

Fender

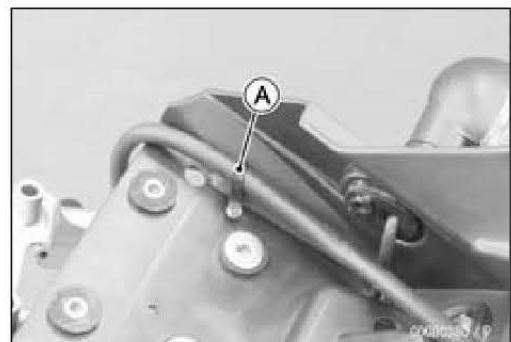
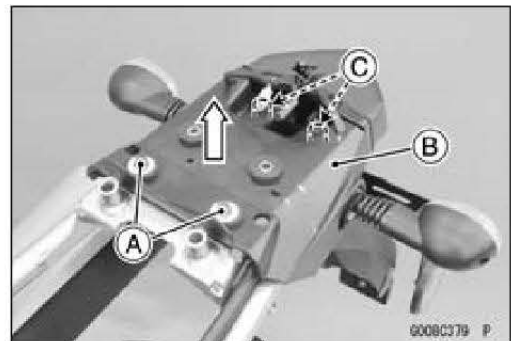
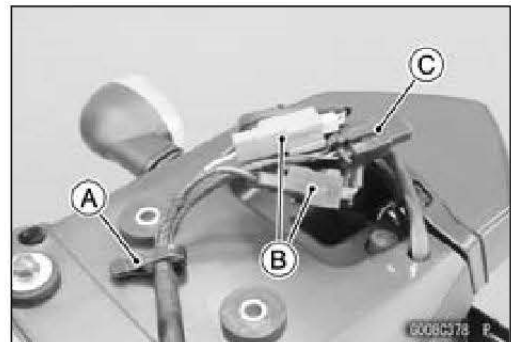
Rear Fender Installation

- Install the rear fender.
- Take care not to damage the harness [A] by the bracket [B].
- Tighten:
Torque - Rear Fender Bolts: 6.9 N·m (0.70 kgf·m, 61 in·lb)
- Install the removed parts.



Flap Removal

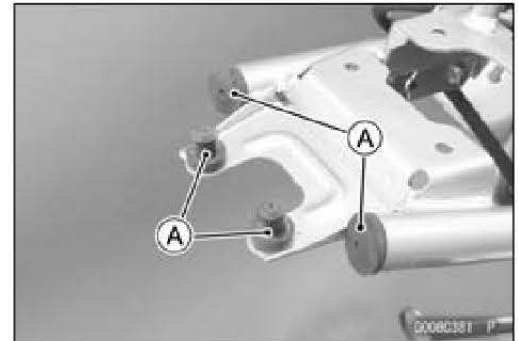
- Remove:
Side Covers (see Side Cover Removal(15-8))
Seat (see Seat Removal (15-7))
Rear Frame Cover (see Rear Frame Cover Removal(15-8))
- Open:
Clamp [A]
- Disconnect:
Turn Signal Light Lead Connectors [B]
Brake/Tail Light Lead Connector [C]
- Remove:
Bolts [A]
- Pull the flap assembly [B] upward to clear the dampers [C].
- Open:
Clamp [A]



Fender

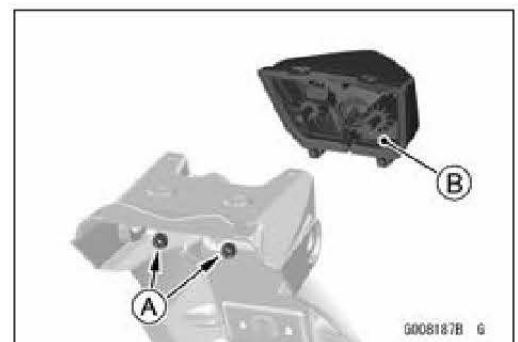
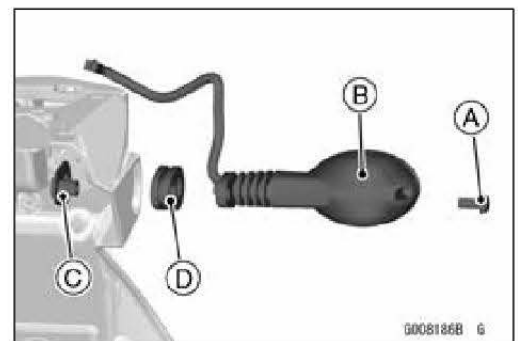
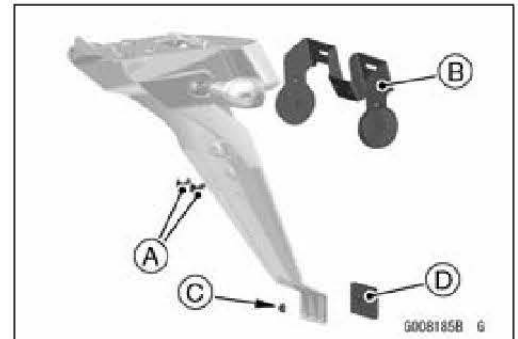
Flap Installation

- Installation is the reverse of removal.
- Check that the dampers [A] are in place.
- Run the leads and harness correctly (see [Cable, Wire, and Hose Routing section \(17-2\)](#)).



Flap Disassembly

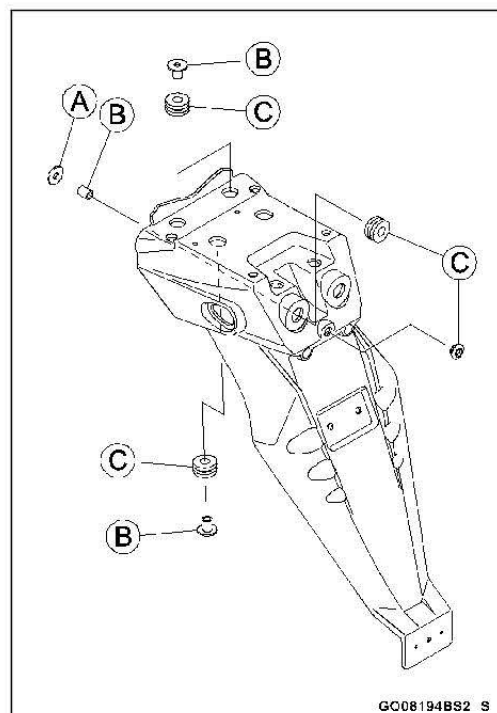
- Remove:
 - Screws [A]
 - License Plate Bracket [B]
 - Nut [C]
 - Tail Reflector [D]
- Remove:
 - Screw [A]
 - Turn Signal Light [B]
 - Collar [C]
 - Damper [D]
- Remove the other side in the same way.
- Remove:
 - Brake/Tail Light Mounting Nuts [A]
 - Brake/Tail Light [B]



15-14 FRAME

Fender

- Remove:
Washers [A]
Collars [B]
Dampers [C]



Flap Assembly

- Assembly is the reverse of disassembly.

Frame

Frame Inspection

- Visually inspect the frame for cracks, dents, bending, or warping.
- ★ If there is any damage to the frame, replace it.



WARNING

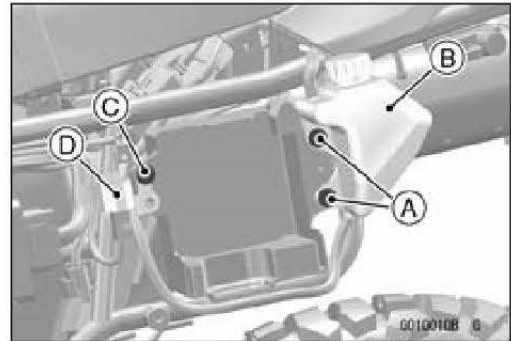
A repaired frame may fail in use, possibly causing an accident resulting in injury or death. If the frame is bent, dented, cracked, or warped, replace it.

15-16 FRAME

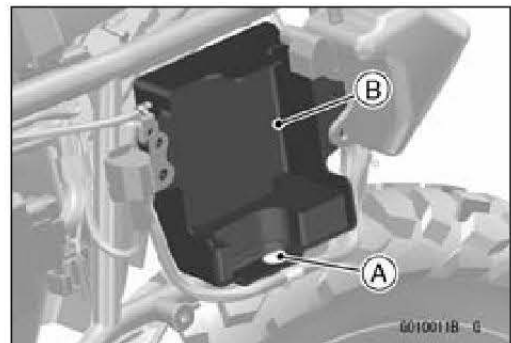
Battery Case

Battery Case Removal

- Remove:
 - Left Side Cover (see Side Cover Removal(15-8))
 - Battery (see Battery Removal(16-20))
- Remove the coolant reserve tank bolts [A] to free the coolant reserve tank [B].
- Remove the bolt [C] to free the turn signal relay [D] and the bracket.



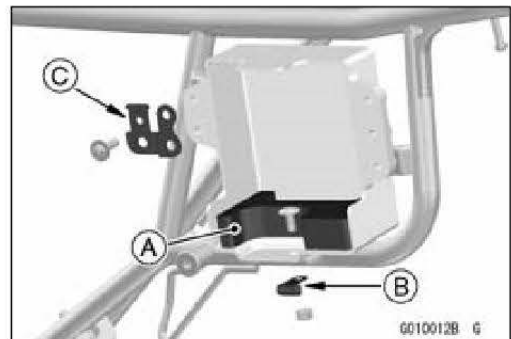
- Remove:
 - Screw [A] and Nut
 - Battery Case [B]



Battery Case Installation

- Installation is the reverse of removal.
- Check that the damper [A] is in place.
- Place the clamp [B] for the radiator overflow hose under the frame.
- Place the turn signal relay bracket [C] to the outside of the battery case.
- Tighten:

Torque - Coolant Reserve Tank Bolts: 6.9 N·m (0.70 kgf·m, 61 in·lb)



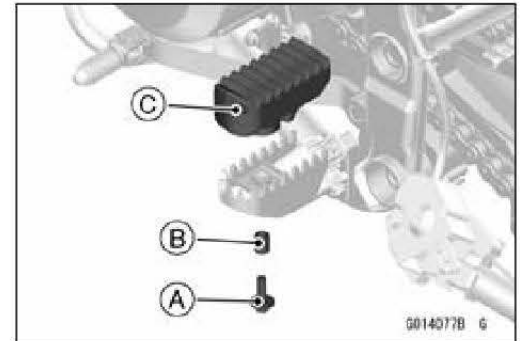
Footpegs

Front Footpeg Removal

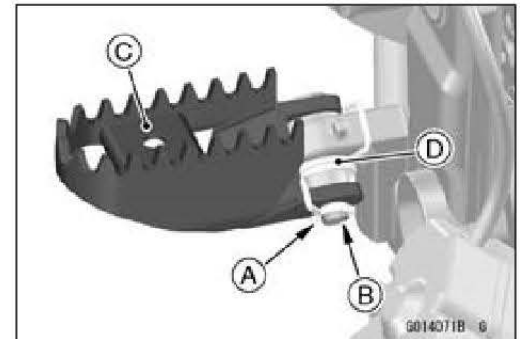
Front Footpeg

- (KLX300E) Remove the followings if necessary.

Bolt [A]
Collar [B]
Damper [C]

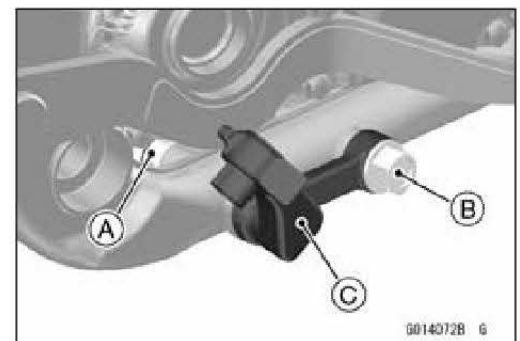


- Remove:
Cotter Pin [A]
Pivot Pin [B]
Footpeg [C]
Spring [D]



Front Footpeg Bracket

- Remove:
Front Footpeg Bracket Nut [A]
Front Footpeg Bracket Bolt [B]
Front Footpeg Bracket [C]



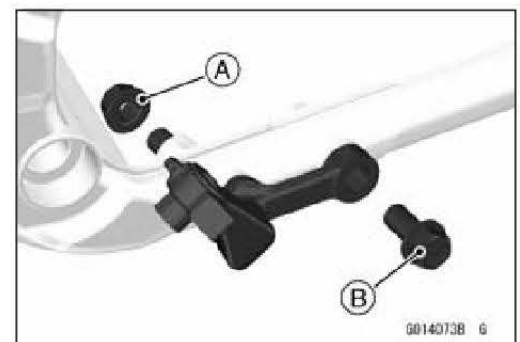
Front Footpeg Installation

Front Footpeg Bracket

- Replace the front footpeg bracket nut [A] with a new one.
- Tighten:

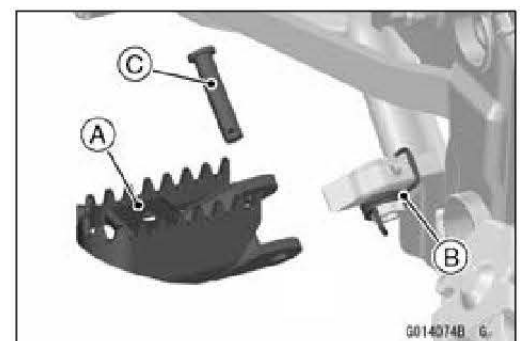
Torque - Front Footpeg Bracket Bolt [B]: 39 N·m (4.0 kgf·m, 29 ft·lb)

Front Footpeg Bracket Nut: 39 N·m (4.0 kgf·m, 29 ft·lb)



Front Footpeg

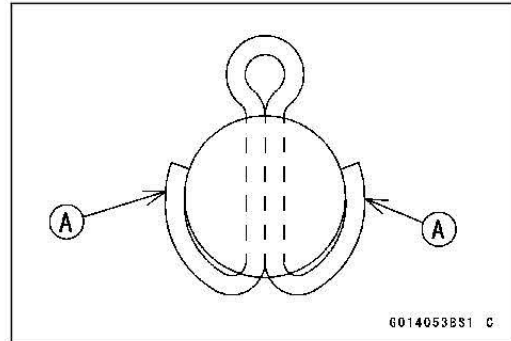
- Replace the cotter pin with a new one.
 - Apply grease to the sliding surface of the front footpeg [A].
 - Install:
Spring [B]
Front Footpeg
Pivot Pin [C]
- Hook the spring end as shown.
- Insert the pivot pin from front side.



15-18 FRAME

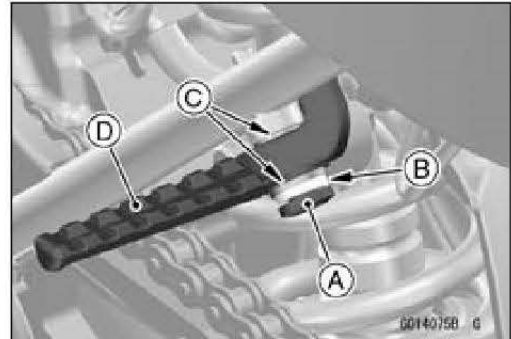
Footpegs

- Install the cotter pin and bend its ends [A] along the pivot pin.
- (KLX300E) Install the damper if it is removed.



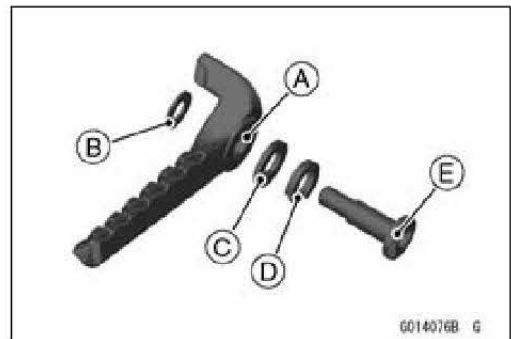
Rear Footpeg Removal

- Remove:
 - Rear Footpeg Bolt [A]
 - Spring Washer [B]
 - Washers [C]
 - Rear Footpeg [D]



Rear Footpeg Installation

- Apply grease to the sliding surface of the following parts.
 - Rear Footpeg [A]
 - Thinner Washer, $\phi 16$ mm (0.63 in.) [B]
 - Thicker Washer, $\phi 19$ mm (0.75 in.) [C]
- Install:
 - Washers
 - Rear Footpeg
 - Spring Washer [D]
- Tighten:



Torque - Rear Footpeg Pivot Bolts [E]: 25 N·m (2.5 kgf·m, 18 ft·lb)

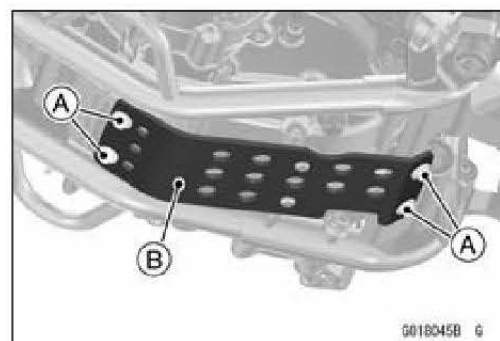
Guard

Engine Guard Removal

NOTE

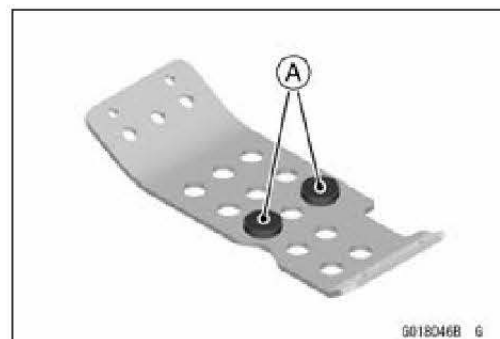
○The engine guard is equipped on KLX300D only.

- Remove:
 - Bolts [A]
 - Engine Guard [B]



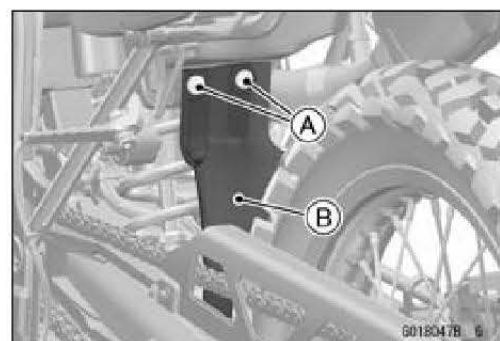
Engine Guard Installation

- Installation is the reverse of removal.
- Check that the dampers [A] are in place.



Mud Guard Removal

- Remove:
 - Bolts [A]
 - Mud Guard [B]



Mud Guard Installation

- Installation is the reverse of removal.

15-20 FRAME

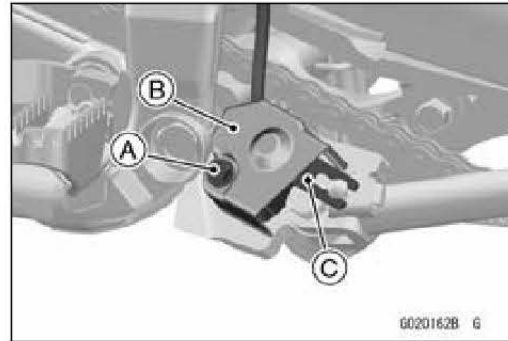
Side Stand

Side Stand Removal

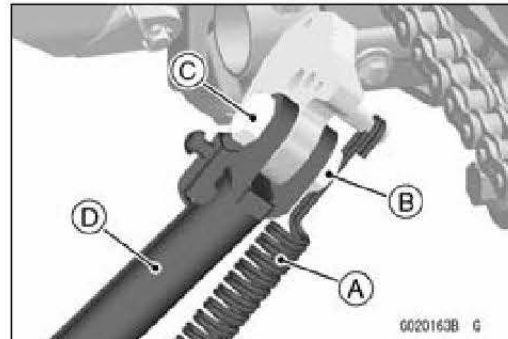
- Raise the rear wheel off the ground with a suitable stand or jack.

Special Tool - Jack: 57001-1238

- Remove:
 - Side Stand Switch Bolt [A] and Collar Cover [B]
 - Side Stand Switch [C]

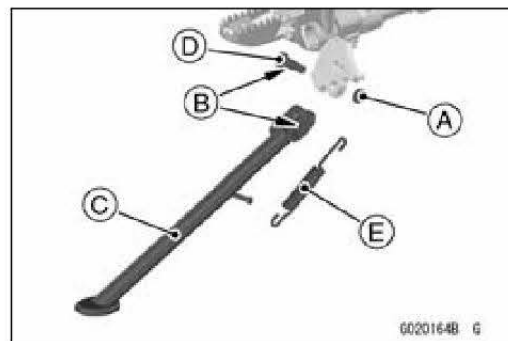


- Remove:
 - Spring [A]
 - Side Stand Nut [B]
 - Side Stand Bolt [C]
 - Side Stand [D]



Side Stand Installation

- Replace the side stand nut [A] with a new one.
- Apply grease to the sliding surfaces [B].
- Install the side stand [C].
- Tighten:
 - Torque - Side Stand Bolt [D]: 30 N·m (3.1 kgf·m, 22 ft·lb)**
 - Side Stand Nut: 44 N·m (4.5 kgf·m, 32 ft·lb)**
- Install the spring [E].
 - The spring has installation direction. Place the spring ends as shown.
- Install the side stand switch ([see Side Stand Switch Installation\(16-79\)](#)).

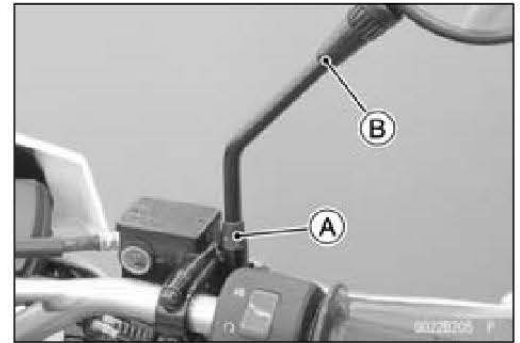


Rear View Mirrors

Rear View Mirror Removal

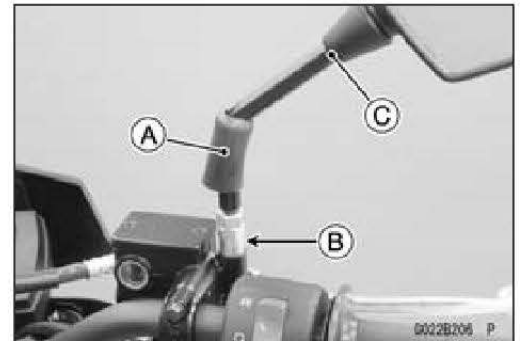
KLX300D

- Loosen the locknut [A], and remove the rear view mirror stay [B].



KLX300E

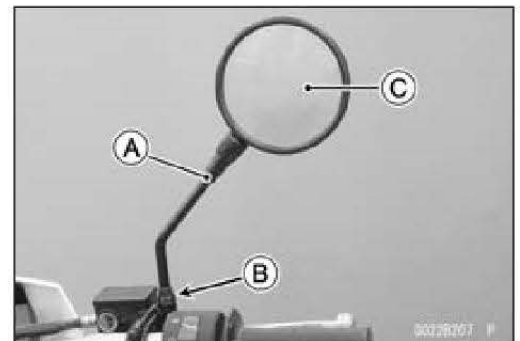
- Slide the rubber boots [A].
- Loosen the lower nut [B], and remove the rear view mirror assembly [C].



Rear View Mirror Installation

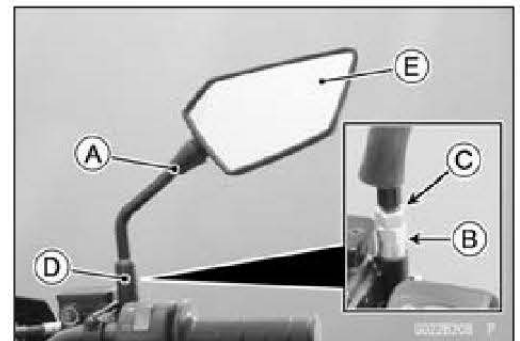
KLX300D

- Install the rear view mirror stay [A] and screw it fully.
 - Adjust the rear view mirror stay to assure the safe conditions of the rear with the rider sitting on the motorcycle.
 - Tighten the locknut [B].
 - Adjust the rear view mirror [C] by slightly moving only the mirror portion of the assembly.
- Install the other side in the same way.



KLX300E

- Install the rear view mirror assembly [A] and tighten the lower nut [B].
 - Loosen the upper nut [C] and adjust the rear view mirror stay to assure the safe conditions of the rear with the rider sitting on the motorcycle.
- The upper nut and rear view mirror stay are left-hand threads.
- Tighten the upper nut.
 - Install the rubber boot [D].
 - Adjust the rear view mirror [E] by slightly moving only the mirror portion of the assembly.
- Install the other side in the same way.



Electrical System

Table of Contents

Exploded View.....	16-4
Specifications	16-10
Special Tools and Sealant	16-11
Parts Location.....	16-13
Wiring Diagram.....	16-16
Precautions.....	16-18
Electrical Wiring.....	16-19
Wiring Inspection	16-19
Battery	16-20
Battery Removal	16-20
Battery Installation	16-20
Precautions	16-20
Interchange	16-21
Charging Condition Inspection.....	16-21
Refreshing Charge.....	16-22
Charging System.....	16-24
Alternator Cover Removal.....	16-24
Alternator Cover Installation.....	16-25
Stator Coil Removal	16-26
Stator Coil Installation	16-26
Alternator Rotor Removal	16-27
Alternator Rotor Installation	16-28
Charging Voltage Inspection	16-30
Alternator Inspection	16-30
Regulator/Rectifier Removal	16-32
Regulator/Rectifier Installation	16-32
Regulator/Rectifier Inspection.....	16-32
Charging System Circuit	16-34
Ignition System.....	16-35
Safety Instructions	16-35
Ignition Timing Inspection	16-35
Crankshaft Sensor Removal.....	16-35
Crankshaft Sensor Installation	16-36
Crankshaft Sensor Inspection.....	16-36
Crankshaft Sensor Peak Voltage Inspection.....	16-36
Ignition Coil Removal	16-37
Ignition Coil Installation	16-37
Ignition Coil Inspection.....	16-38
Ignition Coil Primary Peak Voltage Inspection	16-39
Spark Plug Removal	16-39
Spark Plug Installation	16-39
Spark Plug Cleaning and Inspection.....	16-40
Interlock Operation Inspection	16-40
Ignition System Troubleshooting.....	16-41
Interlock Diode Unit Inspection	16-42
Ignition System Circuit	16-43
Electric Starter System.....	16-44
Starter Motor Removal.....	16-44
Starter Motor Installation.....	16-44
Starter Motor Disassembly.....	16-45

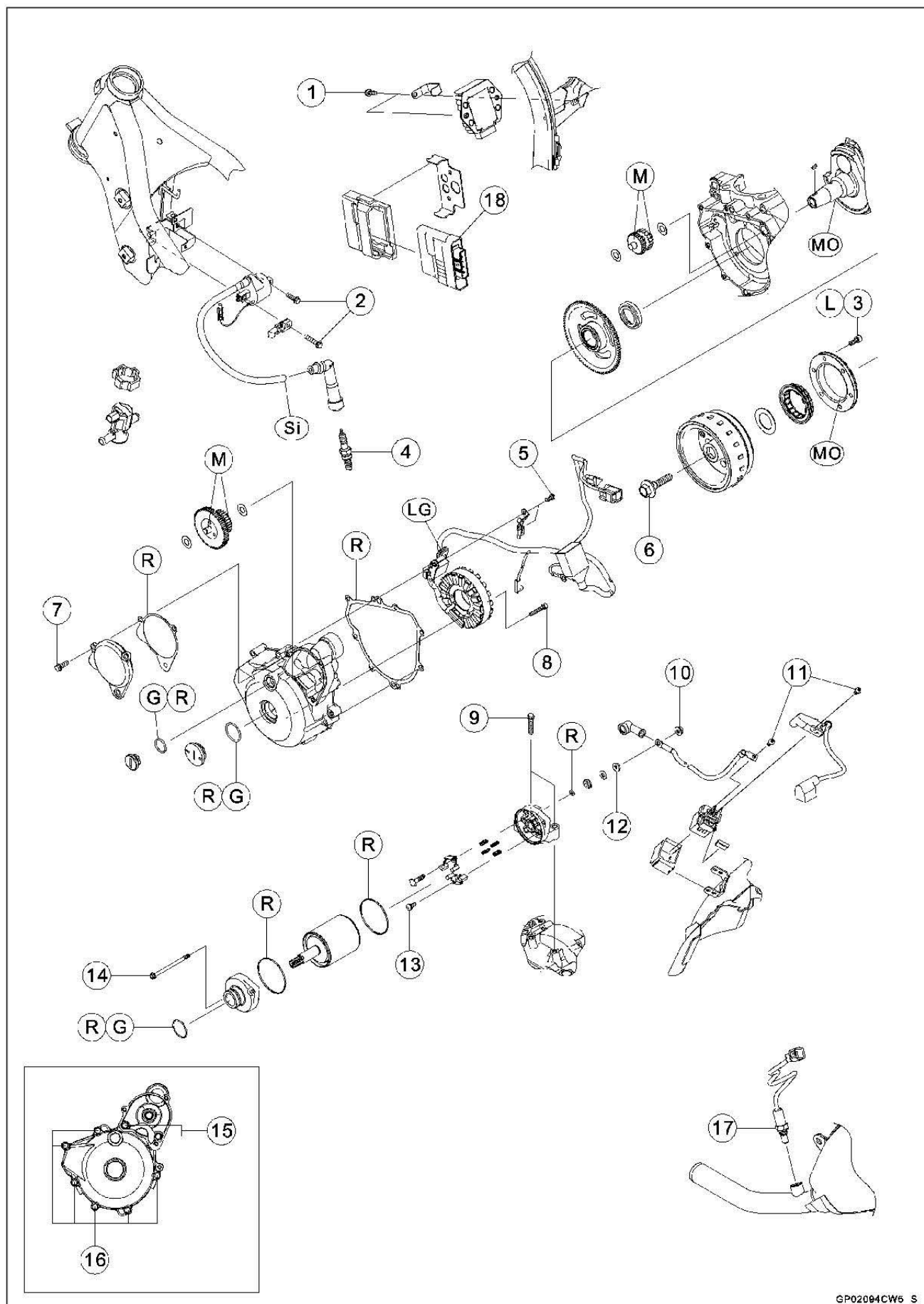
16-2 ELECTRICAL SYSTEM

Starter Motor Assembly	16-46
Brush Inspection	16-48
Commutator Cleaning and Inspection.....	16-48
Armature Inspection.....	16-48
Brush Lead Inspection	16-49
End Cover Inspection.....	16-49
Starter Relay Removal.....	16-49
Starter Relay Inspection.....	16-49
Starter Circuit Relay Inspection	16-50
Electric Starter Circuit	16-51
Lighting System.....	16-52
Headlight Beam Horizontal Adjustment	16-52
Headlight Beam Vertical Adjustment.....	16-52
Headlight Removal.....	16-52
Headlight Installation.....	16-52
Headlight Bulb Replacement	16-53
Brake/Tail Light Removal	16-54
Brake/Tail Light Installation	16-55
Brake/Tail Light Bulb Replacement.....	16-55
Headlight/Tail Light Circuit	16-57
Turn Signal Light Bulb Replacement	16-57
Turn Signal Relay Inspection	16-58
Turn Signal Light Circuit.....	16-60
Air Switching Valve	16-61
Air Switching Valve Operation Test	16-61
Air Switching Valve Unit Test	16-61
Air Switching Valve Circuit	16-62
Radiator Fan System.....	16-63
Radiator Fan Relay Inspection.....	16-63
Fan Motor Inspection	16-63
Radiator Fan Circuit.....	16-64
Meter, Gauge, Indicator Unit.....	16-65
Meter Unit Removal	16-65
Meter Unit Installation	16-65
Meter Unit Disassembly	16-65
Meter Unit Inspection	16-66
Meter Unit Circuit	16-74
Switches and Sensors	16-75
Water Temperature Sensor Inspection	16-75
Speed Sensor Removal.....	16-75
Speed Sensor Installation	16-76
Speed Sensor Inspection.....	16-76
Fuel Reserve Switch Inspection.....	16-77
Oxygen Sensor Removal.....	16-77
Oxygen Sensor Installation	16-78
Oxygen Sensor Inspection.....	16-78
Oxygen Sensor Heater Inspection	16-78
Side Stand Switch Removal.....	16-78
Side Stand Switch Installation.....	16-79
Brake Light Timing Inspection.....	16-79
Brake Light Timing Adjustment	16-79
Switch Inspection	16-79
Fuse.....	16-80
20 A Main Fuse Removal.....	16-80
Fuse Box Fuse Removal.....	16-80
Fuse Installation.....	16-80
Fuse Inspection.....	16-81

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16-4 ELECTRICAL SYSTEM

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Regulator/Rectifier Bolts	9.8	1.0	87 in·lb	
2	Ignition Coil Bolts	5.9	0.60	52 in·lb	
3	Starter Motor Clutch Bolts	12	1.2	106 in·lb	L
4	Spark Plug	13	1.3	115 in·lb	
5	Crankshaft Sensor Screws	2.5	0.25	22 in·lb	
6	Alternator Rotor Bolt	135	13.8	100	
7	Torque Limiter Cover Bolts	9.8	1.0	87 in·lb	
8	Stator Coil Bolts	5.9	0.60	52 in·lb	
9	Starter Motor Mounting Bolts	9.8	1.0	87 in·lb	
10	Starter Motor Cable Nut	9.8	1.0	87 in·lb	
11	Starter Relay Terminal Screws	5.0	0.51	44 in·lb	
12	Starter Motor Terminal Locknut	11	1.1	97 in·lb	
13	Brush Holder Screw	3.8	0.39	34 in·lb	
14	Starter Motor Through Bolts	5.0	0.51	44 in·lb	
15	Alternator Cover Bolts (L = 30 mm)	9.8	1.0	87 in·lb	
16	Alternator Cover Bolts (L = 40 mm)	9.8	1.0	87 in·lb	
17	Oxygen Sensor	25	2.5	18	

18. ECU

G: Apply grease.

L: Apply a non-permanent locking agent.

LG: Apply liquid gasket.

M: Apply molybdenum disulfide grease.

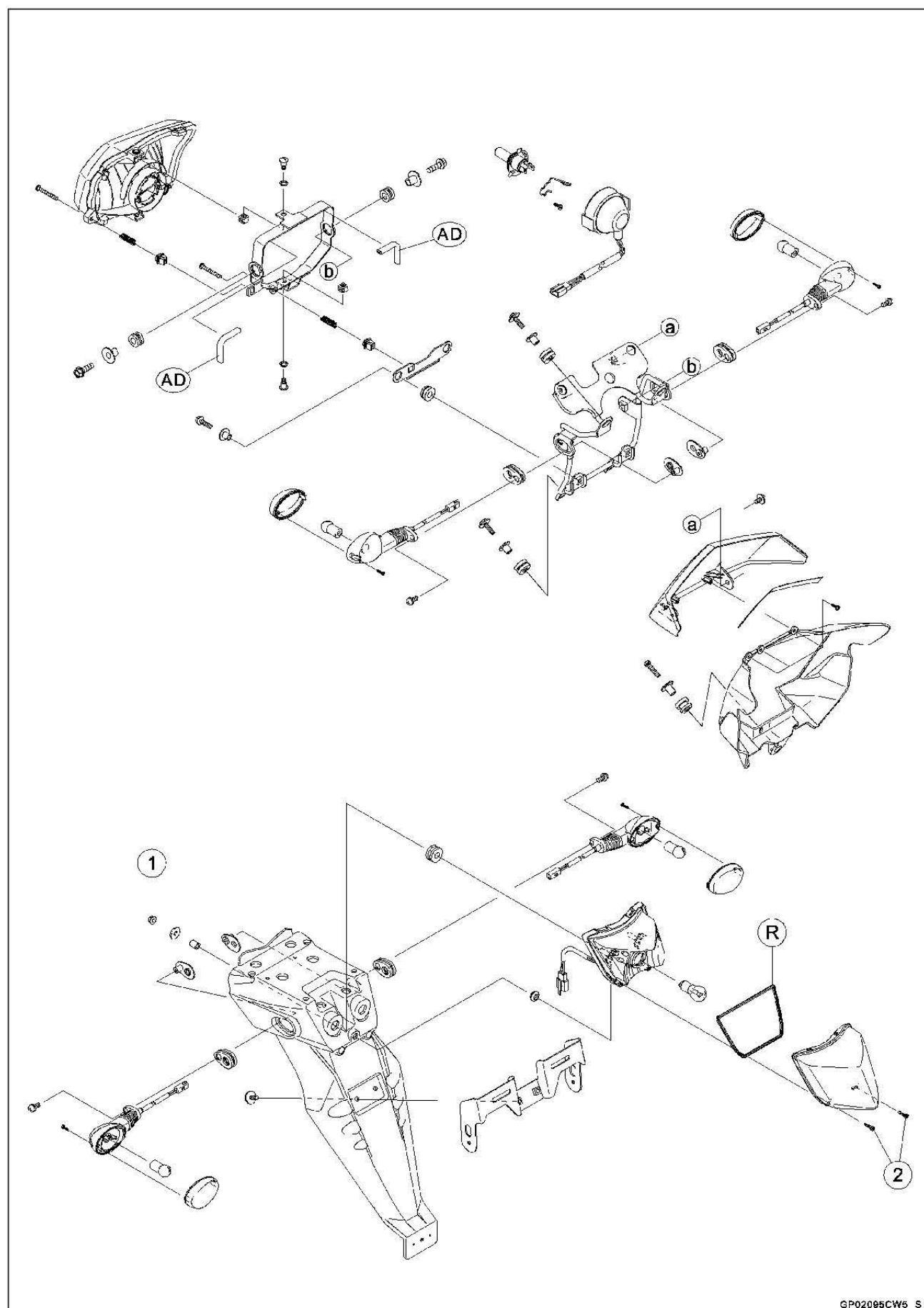
MO: Apply molybdenum disulfide oil solution (mixture of engine oil and molybdenum disulfide grease in a weight ratio is 10:1).

R: Replacement Parts

Si: Apply silicone grease.

16-6 ELECTRICAL SYSTEM

Exploded View



Exploded View

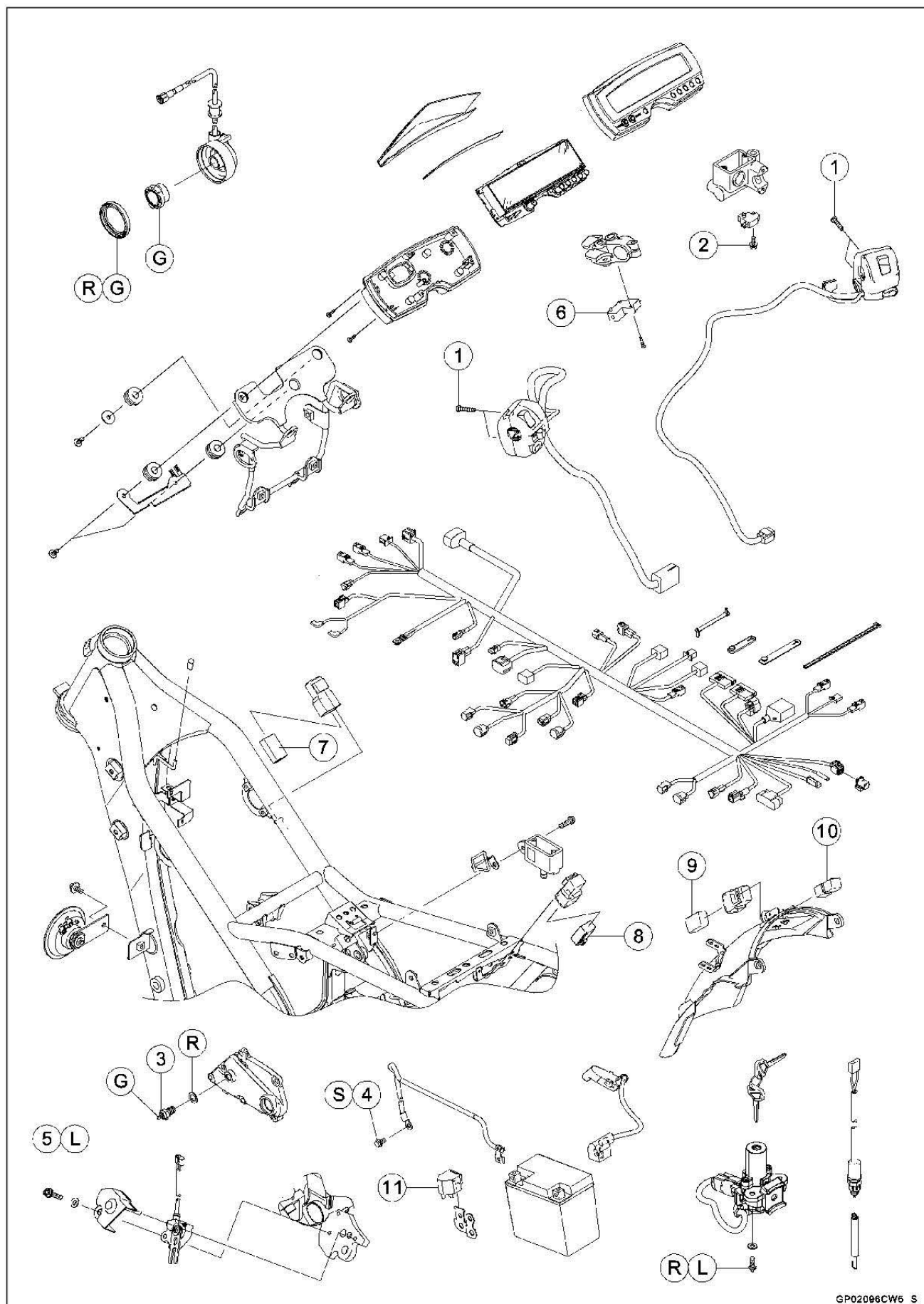
No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Brake/Tail Light Mounting Nuts	5.9	0.60	52 in·lb	
2	Brake/Tail Light Lens Screws	1.0	0.10	8.9 in·lb	

AD: Apply adhesive.

R: Replacement Parts

16-8 ELECTRICAL SYSTEM

Exploded View



Exploded View

No.	Fastener	Torque			Remarks
		N·m	kgf·m	ft·lb	
1	Switch Housing Screws	3.5	0.36	31 in·lb	
2	Front Brake Light Switch Screw	1.2	0.12	11 in·lb	
3	Neutral Switch	15	1.5	11 in·lb	G
4	Engine Ground Terminal Bolt	9.8	1.0	87 in·lb	S
5	Side Stand Switch Bolt	8.8	0.90	78 in·lb	L

6. Starter Lockout Switch

7. Fuel Pump Relay

8. Fan Relay

9. Starter Circuit Relay

10. Interlock Diode Unit

11. Turn Signal Relay

G: Apply grease.

L: Apply a non-permanent locking agent.

R: Replacement Parts

S: Follow the specified tightening sequence.

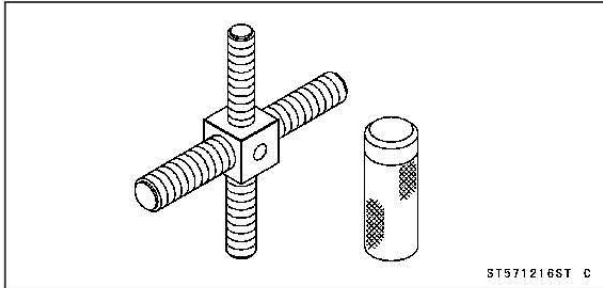
16-10 ELECTRICAL SYSTEM

Specifications

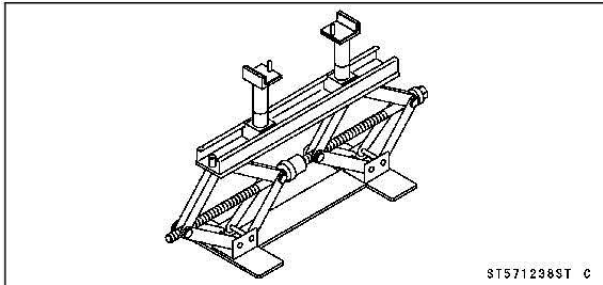
Item	Standard
Battery	
Type	Sealed Battery
Model Name	FTZ7S
Capacity	12 V 6 Ah (10 HR)
Voltage	12.6 V or more
Gross Weight	2.2 kg (4.9 lb)
Electrolyte Volume	0.31 L (19 cu in.)
Charging System	
Alternator Type	Three-phase AC
Charging Voltage (Regulator/Rectifier Output Voltage)	14.4 ~ 15.0 V @25°C (77°F)
Alternator Output Voltage (no load)	39 V or more @4 000 r/min (rpm)
Stator Coil Resistance	0.1 ~ 0.8 Ω @20°C (68°F)
Ignition System	
Ignition Coil:	
3 needle Arcing Distance	6 mm (0.24 in.) or more
Primary Winding Resistance	0.16 ~ 0.24 Ω @20°C (68°F)
Secondary Winding Resistance	5.0 ~ 7.6 k Ω @20°C (68°F)
Primary Peak Voltage	120 V or more
Spark Plug:	
Type	NGK CR8E
Gap	0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)
Cap Resistance	3.75 ~ 6.25 k Ω
Crankshaft Sensor:	
Resistance	192 ~ 288 Ω @20°C (68°F)
Peak Voltage	3.2 V or more
Electric Starter System	
Starter Motor:	
Brush Length	12 mm (0.47 in.) [Service Limit: 6.5 mm (0.26 in.)]
Air Switching Valve	
Resistance	24 ~ 28 Ω @20°C (68°F)
Switches and Sensors	
Rear Brake Light Switch Timing	ON after about 10 mm (0.39 in.) of pedal travel

Special Tools and Sealant

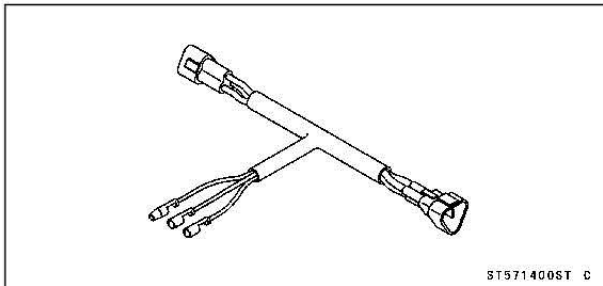
Rotor Puller, M16/M18/M20/M22 × 1.5:
57001-1216



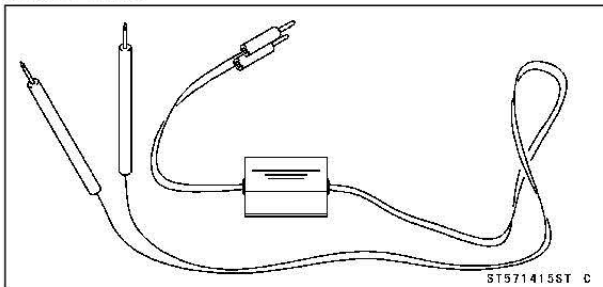
Jack:
57001-1238



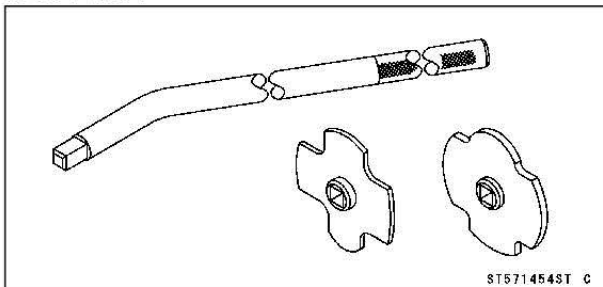
Throttle Sensor Setting Adapter #1:
57001-1400



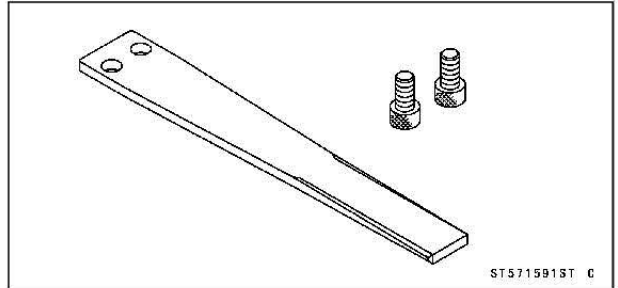
Peak Voltage Adapter:
57001-1415



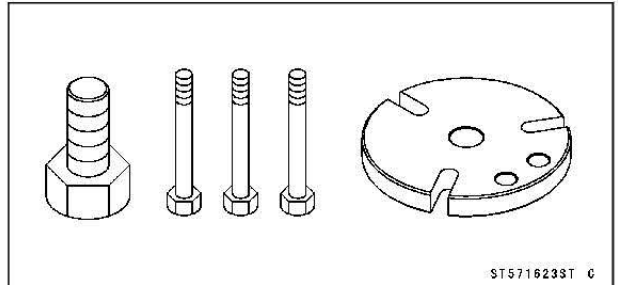
Filler Cap Driver:
57001-1454



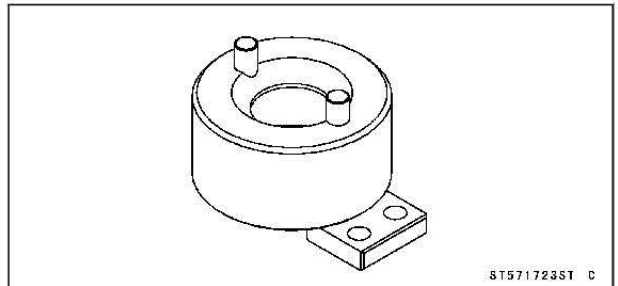
Grip:
57001-1591



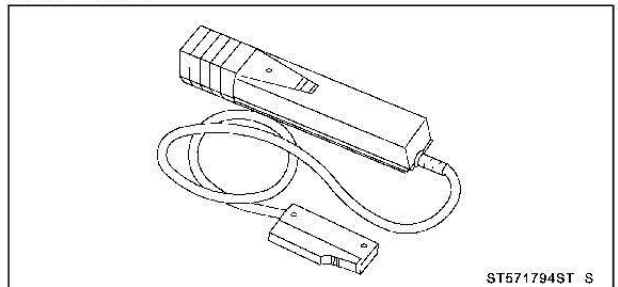
Rotor Puller:
57001-1623



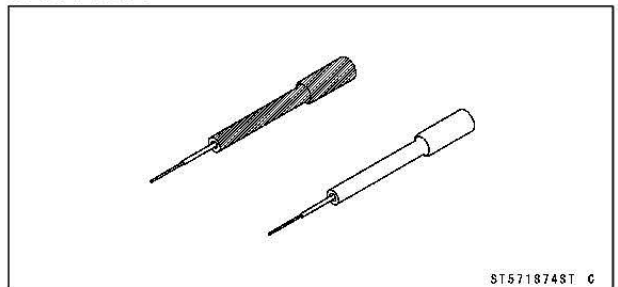
Rotor Holder:
57001-1723



Timing Light:
57001-1794



Needle Adapter Set:
57001-1874

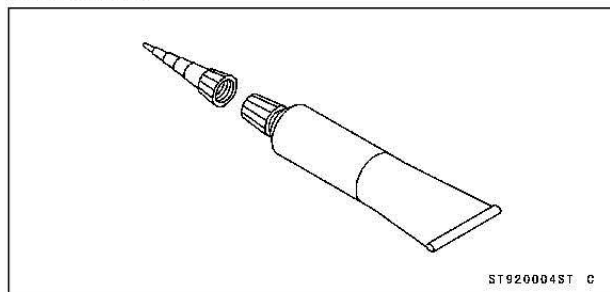


16-12 ELECTRICAL SYSTEM

Special Tools and Sealant

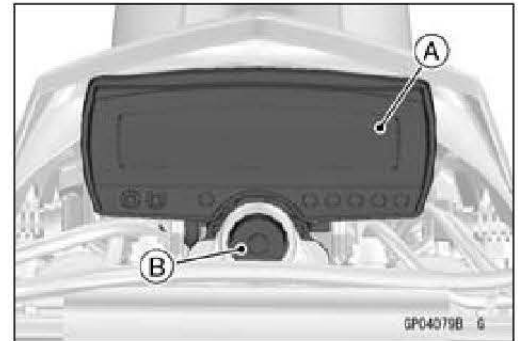
Liquid Gasket, TB1211F:

92104-0004

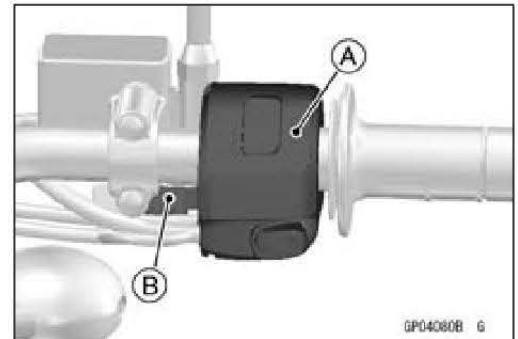


Parts Location

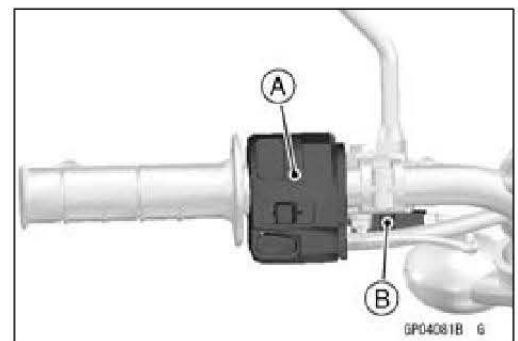
Meter Unit [A]
Ignition Switch [B]



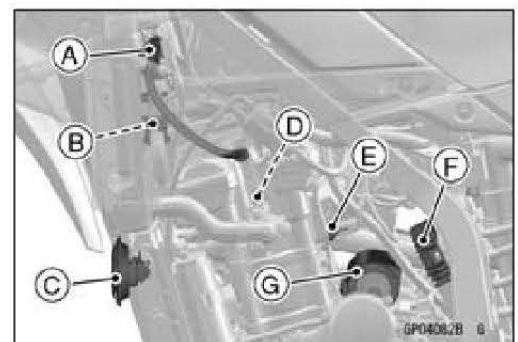
Right Handlebar Switch [A]
Front Brake Light Switch [B]



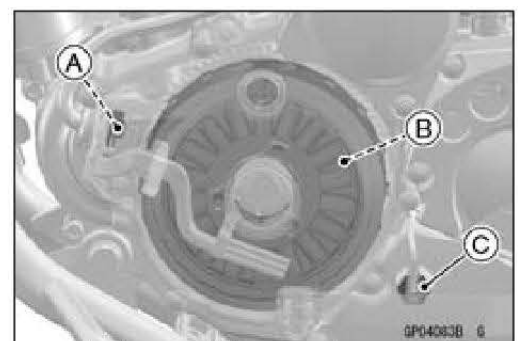
Left Handlebar Switch [A]
Starter Lockout Switch [B]



Ignition Coil [A]
Air Switching Valve [B]
Horn [C]
Spark Plug [D]
Water Temperature Sensor [E]
Regulator/Rectifier [F]
Stator Motor [G]



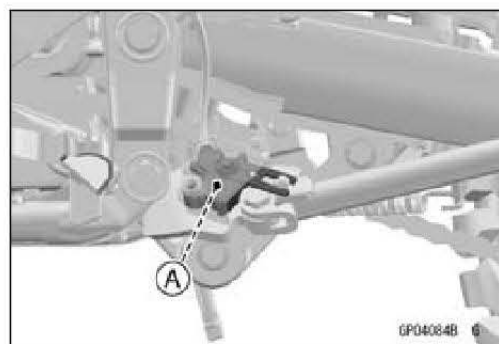
Crankshaft Sensor [A]
Alternator [B]
Neutral Switch [C]



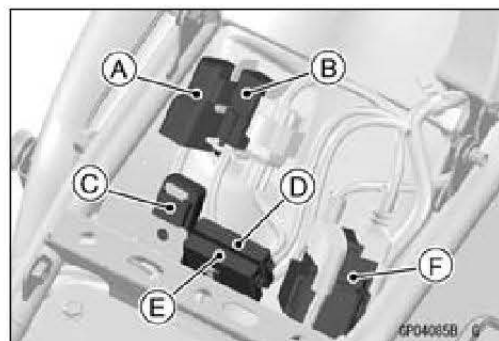
16-14 ELECTRICAL SYSTEM

Parts Location

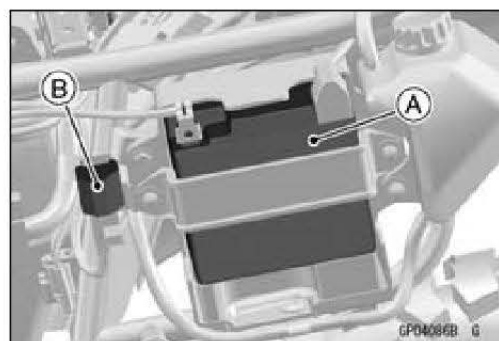
Side Stand Switch [A]



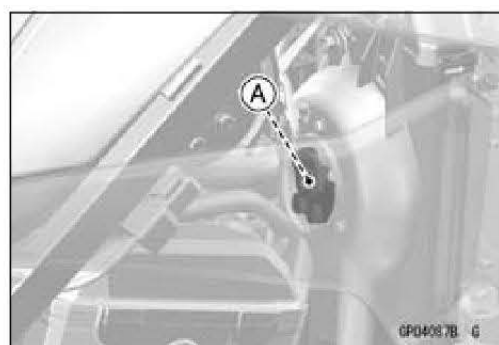
Starter Circuit Relay [A]
Interlock Diode Unit [B]
Radiator Fan Relay [C]
Fuse Box (2) [D]
Fuse Box (1) [E]
Starter Relay, Main Fuse 20 A [F]



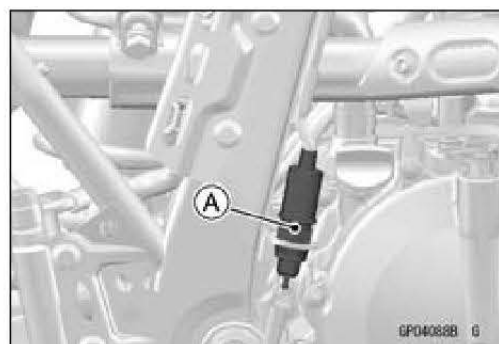
Battery [A]
Turn Signal Relay [B]



Radiator Fan Motor [A]

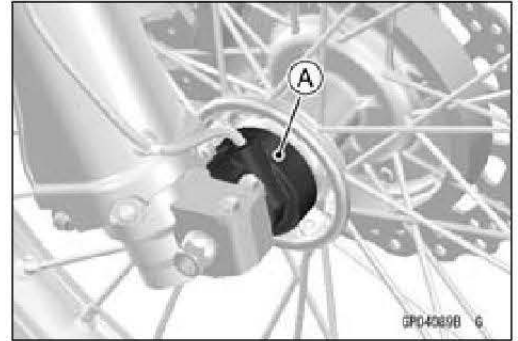


Rear Brake Light Switch [A]



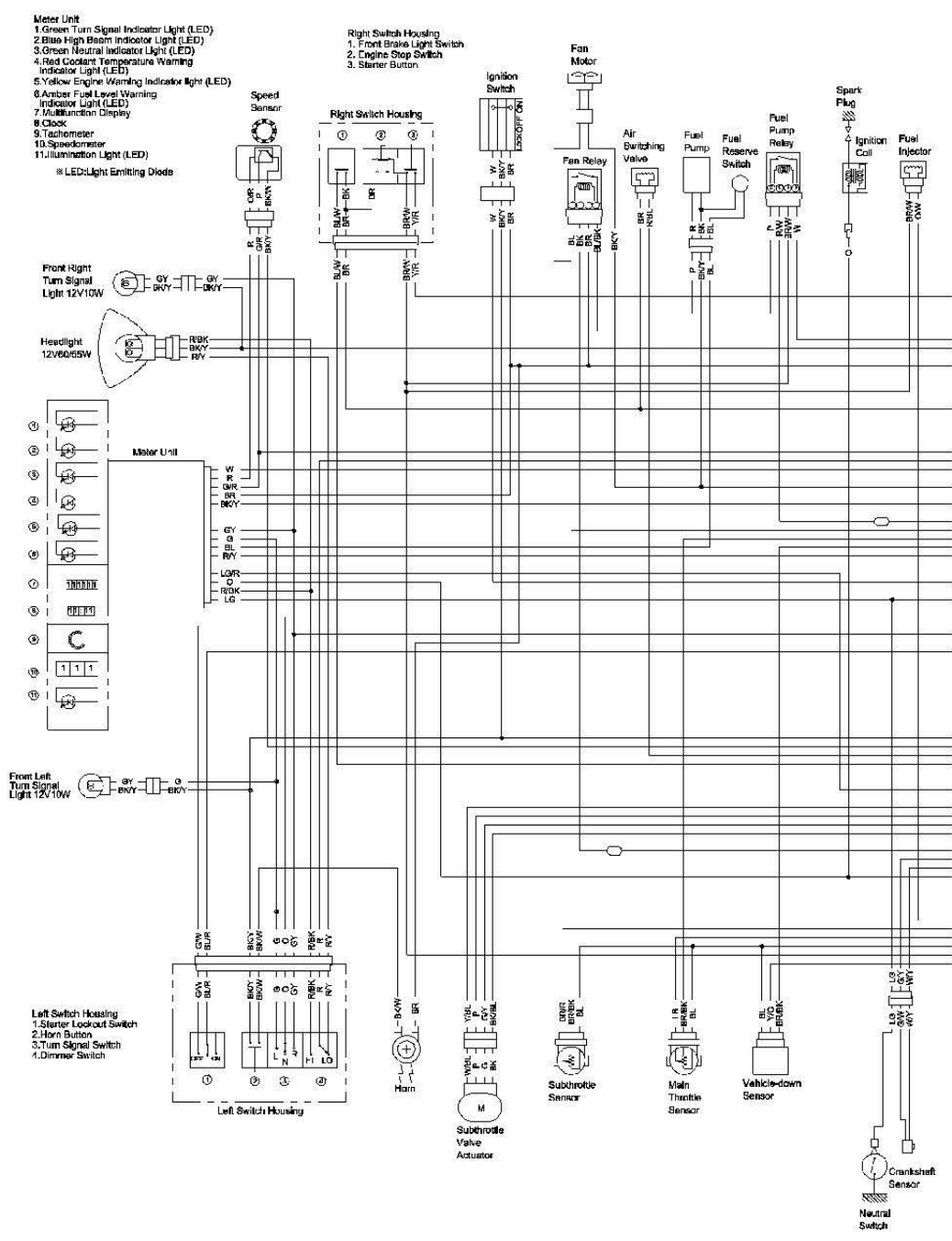
Parts Location

Speed Sensor [A]



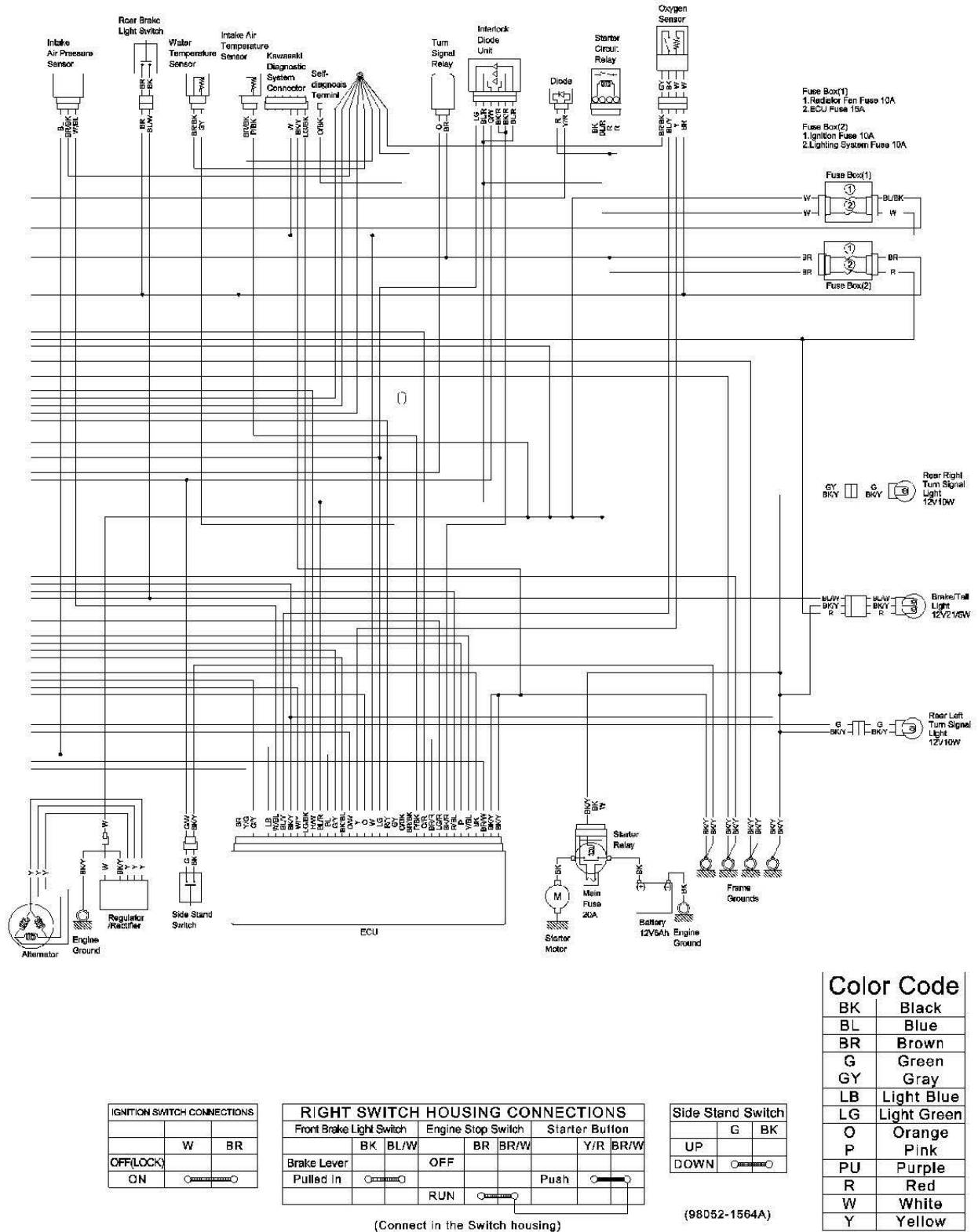
16-16 ELECTRICAL SYSTEM

Wiring Diagram



LEFT SWITCH HOUSING CONNECTIONS											
Starter Lockout Switch			Horn Button		Turn Signal Switch			Dimmer Switch			
Color	G/W	BL/R	Color	BK/Y/BK/W	Color	G	O	GY		R/BK	R
ON			Push		L				HI		
OFF			Released		OFF(Push)				LO		

Wiring Diagram



16-18 ELECTRICAL SYSTEM

Precautions

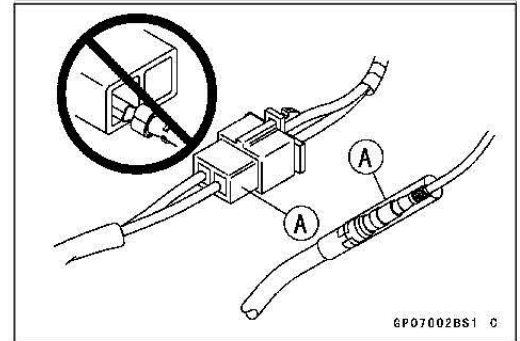
There are a number of important precautions that are musts when servicing electrical systems. Learn and observe all the rules below.

- Do not reverse the battery cable connections. This will burn out the diodes on the electrical parts.
- Always check battery condition before condemning other parts of an electrical system. A fully charged battery is a must for conducting accurate electrical system tests.
- The electrical parts should never be struck sharply, as with a hammer, or allowed to fall on a hard surface. Such a shock to the parts can damage them.
- To prevent damage to electrical parts, do not disconnect the battery cables or any other electrical connections when the ignition switch is on, or while the engine is running.
- Because of the large amount of current, never keep the starter button pushed when the starter motor will not turn over, or the current may burn out the starter motor windings.
- Take care not to short the cables that are directly connected to the battery positive (+) terminal to the chassis ground.
- Troubles may involve one or in some cases all items. Never replace a defective part without determining what CAUSED the failure. If the failure was caused by some other item or items, they must be repaired or replaced, or the new replacement will soon fail again.
- Make sure all connectors in the circuit are clean and tight, and examine wires for signs of burning, fraying, etc. Poor wires and bad connections will affect electrical system operation.
- Measure coil and winding resistance when the part is cold (at room temperature).

Electrical Wiring

Wiring Inspection

- Visually inspect the wiring for signs of burning, fraying, etc.
- ★ If any wiring is poor, replace the damaged wiring.
- Pull each connector [A] apart and inspect it for corrosion, dirt, and damage.
- ★ If the connector is corroded or dirty, clean it carefully. If it is damaged, replace it.
- Check the wiring for continuity.
 - Use the wiring diagram to find the ends of the lead which is suspected of being a problem.
 - Connect a tester between the ends of the leads.
- ★ If the tester does not read about 0 Ω , the lead is defective.
 - Replace the lead or the wiring harness if necessary.



16-20 ELECTRICAL SYSTEM

Battery

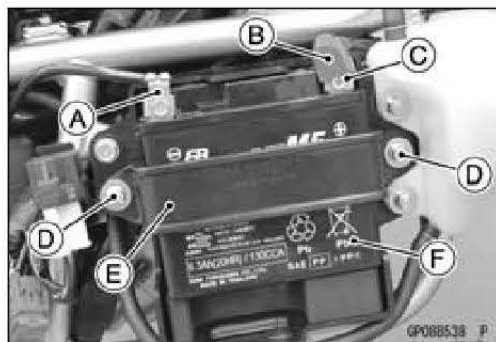
Battery Removal

- Turn the ignition switch off.
- Remove the left side cover (see Side Cover Removal(15-8)).
- Disconnect the negative (–) cable [A].

NOTICE

Be sure to disconnect the negative (–) cable first.

- Slide out the positive (+) terminal cap [B] and disconnect the positive (+) cable [C].
- Remove:
 - Bolts [D]
 - Battery Holder [E]
 - Washer
 - Battery [F]

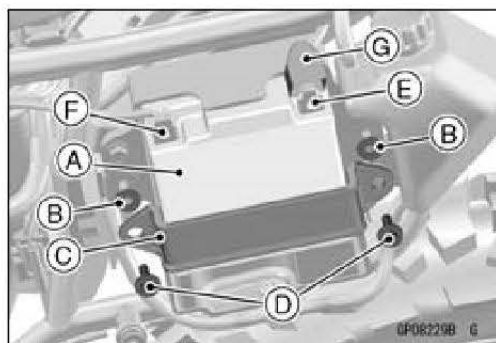


Battery Installation

- Visually inspect the battery for condition.
- ★ If there is crack or electrolyte leakage, replace the battery.
- Check that the pad [A] is in place on the battery case.



- Put the battery [A] on the pad of the battery case.
- Install:
 - Washer [B]
 - Battery Holder [C]
- Tighten the bolts [D].
- Connect the positive cable [E] to the (+) terminal first, and then the negative cable [F] to the (–) terminal.
- Apply a light coat of grease on the terminals to prevent corrosion.
- Cover the (+) terminal with the red cap [G].



Precautions

- 1) No need of topping-up

No topping-up is necessary in this battery until it ends its life under normal use. Forcibly prying off the seal cap to add water is very dangerous. Never do that.

- 2) Refreshing charge.

Give refresh charge for 5 to 10 hours with charge current shown in the specification (see Refreshing Charge(16-22)).

When a fast charge is inevitably required, do it following precisely the maximum charge current and time conditions indicated on the battery.

NOTICE

This battery is designed to sustain no unusual deterioration if refresh-charged according to the method specified above. However, the battery's performance may be reduced noticeably if charged under conditions other than given above. Never remove the seal cap during refresh charge.

If by chance an excessive amount of gas is generated due to overcharging, the relief valve releases the gas to keep the battery normal.

Battery

- 3) When you do not use the motorcycle for months.

Give a refresh charge before you store the motorcycle and store it with the negative cable removed. However, check the battery's state of charge at every 6 months to be sure it meets the minimum 12.6 V specification and charge it to 100% state of charge.

- 4) Battery life.

If the battery will not start the engine even after several refresh charges, the battery has exceeded its useful life. Replace it (Provided, however, the vehicle's starting system has no problem).

⚠ DANGER

Batteries produce an explosive gas mixture of hydrogen and oxygen that can cause serious injury and burns if ignited. Keep the battery away from sparks and open flames during charging. When using a battery charger, connect the battery to the charger before turning on the charger. This procedure prevents sparks at the battery terminals which could ignite any battery gases. The electrolyte contains sulfuric acid. Be careful not to have it touch your skin or eyes. If touched, wash it off with liberal amount of water and seek medical attention for more severe burns.

Interchange

A sealed battery can fully display its performance only when combined with a proper vehicle electric system. Therefore, replace a sealed battery only on a motorcycle which was originally equipped with a sealed battery.

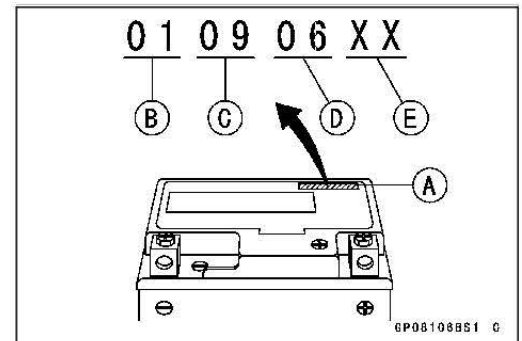
Be careful, if a sealed battery is installed on a motorcycle which had an ordinary battery as original equipment, the sealed battery's life will be shortened.

Battery Date Inspection

- Remove the battery (see [Battery Removal \(16-20\)](#)).
- Check the manufactured date stamp [A].
 - Day [B]
 - Month [C]
 - Year [D]
 - MFG Code [E]

NOTE

- Do refresh charge with the battery that passes one month or more.



Charging Condition Inspection

- Battery charging condition can be checked by measuring battery terminal voltage with a digital voltmeter [A].
- Remove the seat (see [Seat Removal \(15-7\)](#)).
- Disconnect the battery terminals.

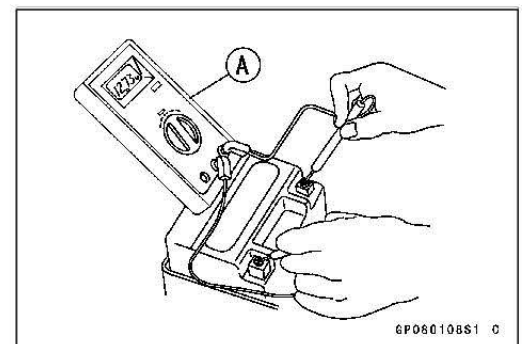
NOTICE

Be sure to disconnect the negative (–) cable first.

- Measure the battery terminal voltage.

NOTE

- Measure with a digital voltmeter which can be read one decimal place voltage.



16-22 ELECTRICAL SYSTEM

Battery

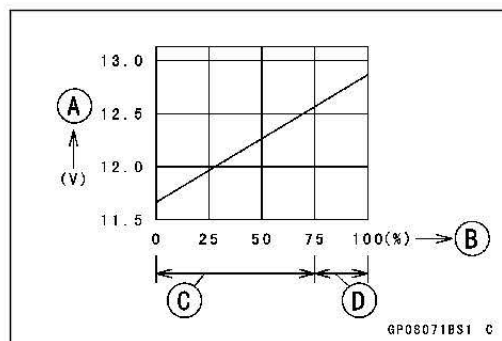
- ★ If the reading is 12.6 V or more, refresh charge is not required, however, if the read is below the 12.6 V, refresh charge is required.

Terminal Voltage (V) [A]

Battery Charge Rate (%) [B]

Refresh charge is required [C]

Good [D]



Refreshing Charge

- Remove the battery (see Battery Removal(16-20)).
- Do refresh charge by following method according to the battery terminal voltage.
- ★ If using a recommended battery charger, follow the charger's instructions for newly activated sealed battery.

Kawasaki-recommended chargers:

Battery Mate 150-9

OptiMate PRO 4-S/PRO S/PRO2

Yuasa MB-2040/2060

Christie C10122S

- ★ If the above chargers are not available, use equivalent one.

⚠ WARNING

This battery is sealed type. Charge with current and time as stated below.

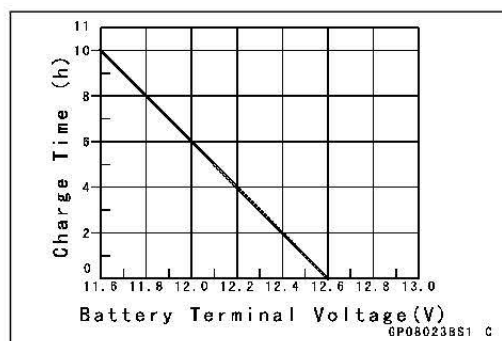
Terminal Voltage: 12.0 ~ 12.6 V

Standard Charge 12.5 A × 5 ~ 10 h (see following chart)

Quick Charge 3 A × 1 h

NOTICE

If possible, do not quick charge. If quick charge is done unavoidably, do standard charge later on.



Terminal Voltage: less than 12 V

Charging Method: 12.5 A × 20 h

NOTE

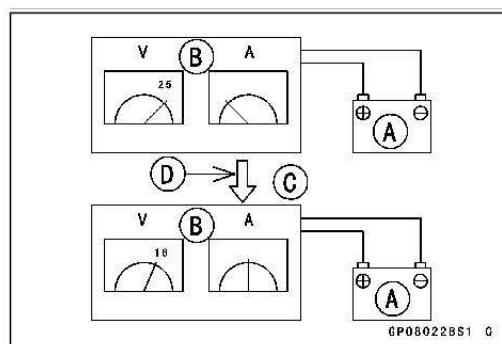
- Increase the charging voltage to a maximum voltage of 25 V if the battery will not accept current initially. Charge for no more than 5 minutes at the increased voltage then check if the battery is drawing current. If the battery will accept current decrease the voltage and charge by the standard charging method described on the battery case. If the battery will not accept current after 5 minutes, replace the battery.

Battery [A]

Battery Charger [B]

Standard Value [C]

Current starts to flow [D].

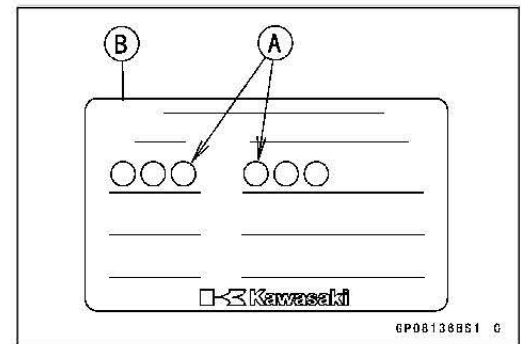


Battery

- Determine the battery condition after refresh charge.
- Determine the condition of the battery left for 30 minutes after completion of the charge by measuring the terminal voltage according to the table below.

Criteria	Judgement
12.6 V or higher	Good
12.0 ~ lower than 12.6 V	Charge insufficient → Recharge
lower than 12.0 V	Unserviceable → Replace

- After recharging, record [A] the charging date and the name of person in charge of this job to the battery recharging record label [B] if necessary.



16-24 ELECTRICAL SYSTEM

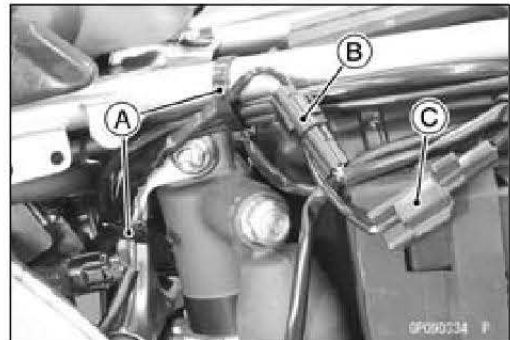
Charging System

Alternator Cover Removal

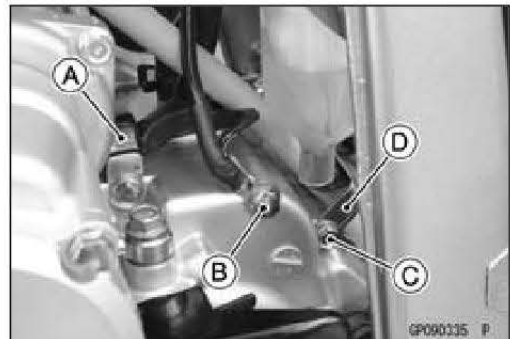
- Drain:
Engine Oil ([see Engine Oil Change\(2-34\)](#))
- Remove:
Shift Pedal ([see Shift Pedal Removal\(9-21\)](#))
Engine Sprocket Cover ([see Engine Sprocket Removal\(11-10\)](#))
Regulator/Rectifier ([see Regulator/Rectifier Removal\(16-32\)](#))
Torque Limiter ([see Torque Limiter Removal\(9-19\)](#))
Left Side Cover ([see Side Cover Removal\(15-8\)](#))
- Remove:
Bolts [A]



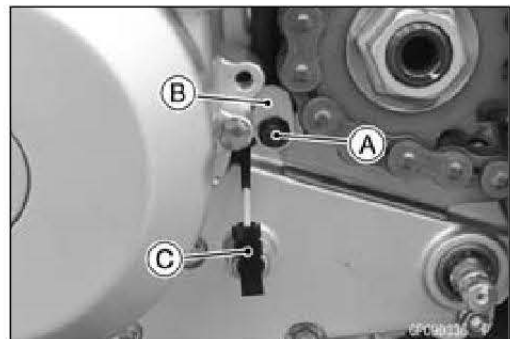
- Remove the bands [A].
- Disconnect:
Crankshaft Sensor Lead Connector [B]
Crankshaft Output Lead Connector [C]



- Open the clamp [A] to free the alternator lead.
- Remove:
Grand Terminal Bolt [B]
Bolt [C]
Guide [D]

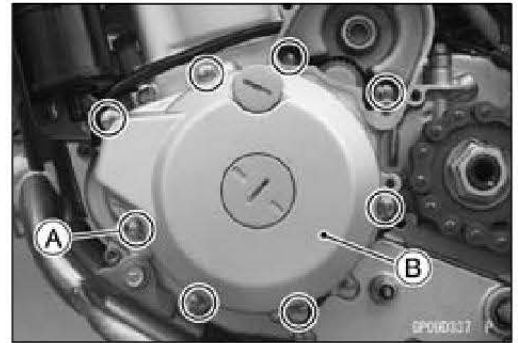


- Remove:
Cover/Guard Plate Bolt [A]
Neutral Switch Lead Retaining Plate [B]
Neutral Switch Connector [C]



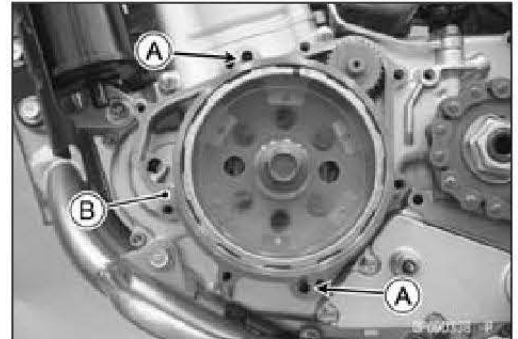
Charging System

- Place a suitable container under the engine.
- Remove:
 - Alternator Cover Bolts [A]
 - Alternator Cover [B]
 - Dowel Pins
 - Gasket



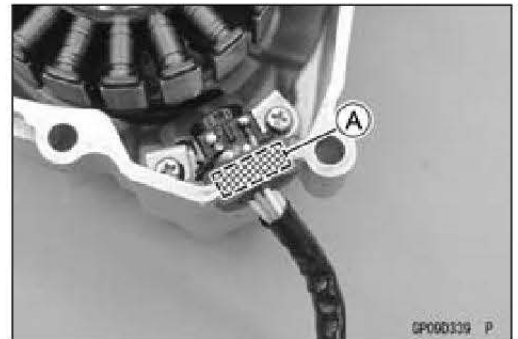
Alternator Cover Installation

- Using a high flash-point solvent, clean off any oil or dirt that may be on the liquid gasket coating area. Dry them with a clean cloth.
- Install the dowel pins [A] into the crankcase.
- Replace the gasket [B] with a new one.

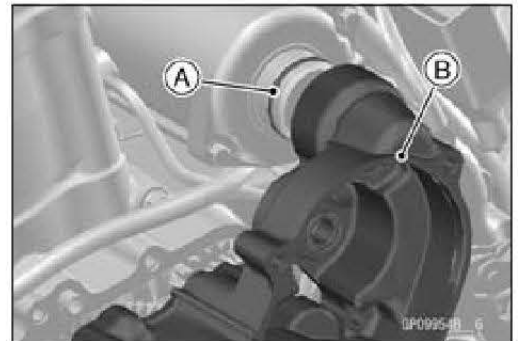


- Apply liquid gasket to the crankshaft sensor and stator coil leads grommet [A].

Sealant - Liquid Gasket, TB1211F: 92104-0004

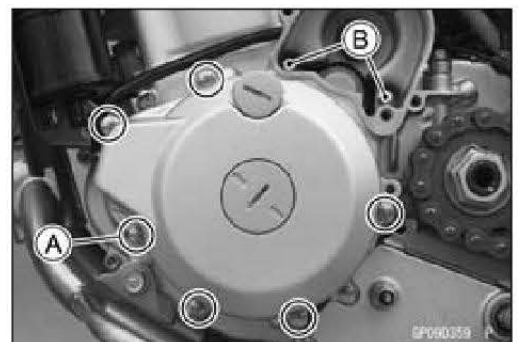


- Run the alternator lead between the starter motor and oil pipe (see [Cable, Wire, and Hose Routing section \(17-2\)](#)).
- Replace the O-ring [A] of the starter motor with a new one.
- Apply grease to the O-ring of the starter motor and install the alternator cover [B].



- Tighten the alternator cover bolts.
 - L = 40 mm (1.6 in.) [A]
 - L = 30 mm (1.2 in.) [B]

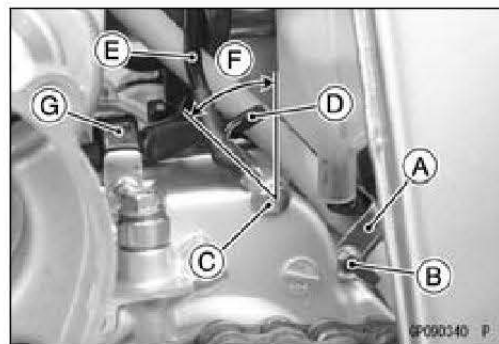
Torque - Alternator Cover Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)



16-26 ELECTRICAL SYSTEM

Charging System

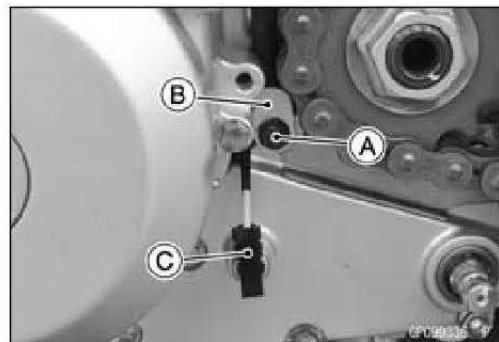
- Install the guide [A] and tighten the bolt [B].
- Install the bolt [C] with the ground terminal [D] of the alternator lead and set the engine ground lead [E] terminal as shown, then tighten the bolt.
40 ~ 50° [F]
- Hold the alternator lead with the clamp [G].



- Apply a non-permanent locking agent to the threads of the cover/guard plate bolt [A].
- Run the neutral switch lead along with the groove on the crankcase and hold it with the retaining plate [B].
- Run the lead correctly (see Cable, Wire, and Hose Routing section (17-2)).
- Connect the neutral switch connector [C].
- Tighten:

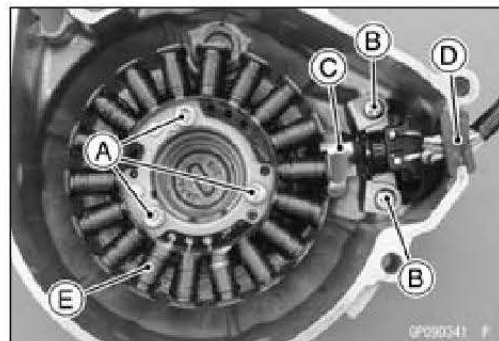
Torque - Cover/Guard Plate Bolt: 9.8 N·m (1.0 kgf·m, 87 in·lb)

- Connect the alternator lead connectors.
- Install the removed parts.



Stator Coil Removal

- Remove:
 - Alternator Cover (see Alternator Cover Removal(16-24))
 - Stator Coil Bolts [A]
 - Crankshaft Sensor Screws [B]
 - Stator Coil Lead Holder [C]
 - Grommet [D]
 - Stator Coil [E] and Crankshaft Sensor



Stator Coil Installation

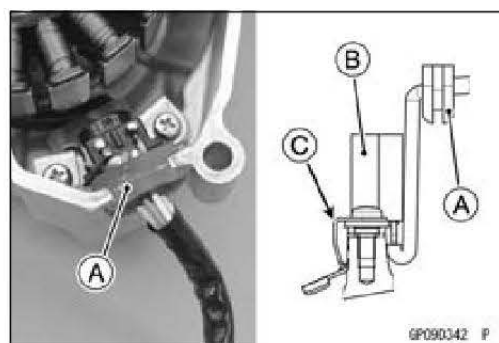
- Install the stator coil, and tighten the bolts.
Torque - Stator Coil Bolts: 5.9 N·m (0.60 kgf·m, 52 in·lb)
- Using a high flash-point solvent, clean off any oil or dirt that may be on the liquid gasket coating area. Dry them with a clean cloth.
- Apply liquid gasket to the circumference of the grommet [A].

Sealant - Liquid Gasket, TB1211F: 92104-0004

- Set the grommet securely in the notch.
- Install the crankshaft sensor [B] and holder [C].
- Run the stator coil and crankshaft sensor leads under the holder and crankshaft sensor.
- When installing the sensor which is fastened by screws, tighten the screws after placing the sensor on the bottom surface completely.
- Tighten:

Torque - Crankshaft Sensor Screws: 2.5 N·m (0.25 kgf·m, 22 in·lb)

- Install the alternator cover (see Alternator Cover Installation(16-25)).



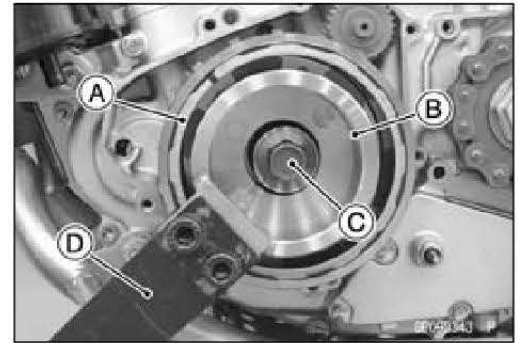
Charging System

Alternator Rotor Removal

- Remove the alternator cover (see Alternator Cover Removal(16-24)).
- Hold the alternator rotor [A] steady with the rotor holder [B], and remove the rotor bolt [C].

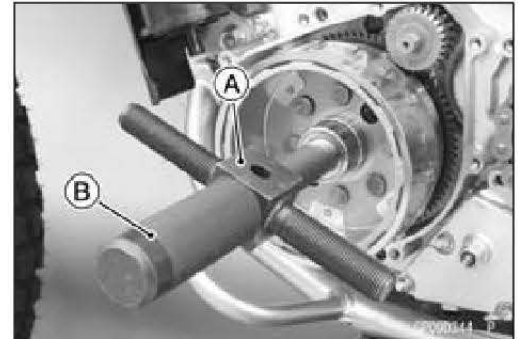
Special Tools - Grip [D]: 57001-1591

Rotor Holder: 57001-1723



- Using the rotor puller [A], remove the alternator rotor.

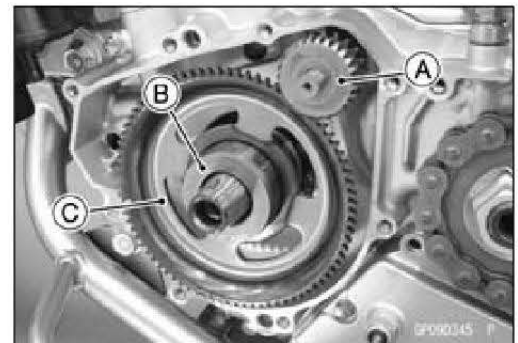
Special Tool - Rotor Puller, M16/M18/M20/M22 × 1.5: 57001-1216



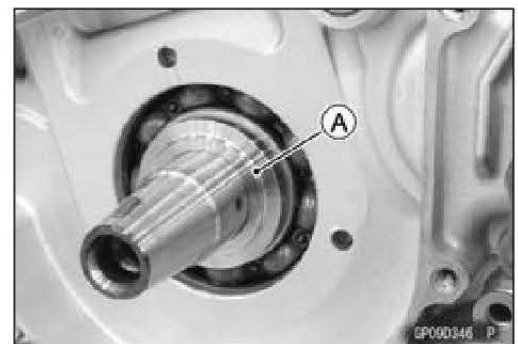
NOTICE

If the rotor is difficult to remove, turn the puller shaft using a wrench while tapping the head [B] of the puller shaft with a hammer. Do not attempt to strike the grab bar or the alternator rotor itself. Striking the bar or the rotor can cause the bar to bend or the magnets to lose their magnetism.

- Remove:
Idle Gear [A] and Washers
Washer [B]
Starter Motor Clutch Gear [C]



- Remove the collar [A] from the crankshaft.

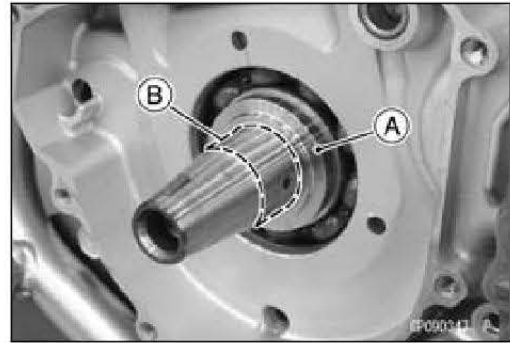


16-28 ELECTRICAL SYSTEM

Charging System

Alternator Rotor Installation

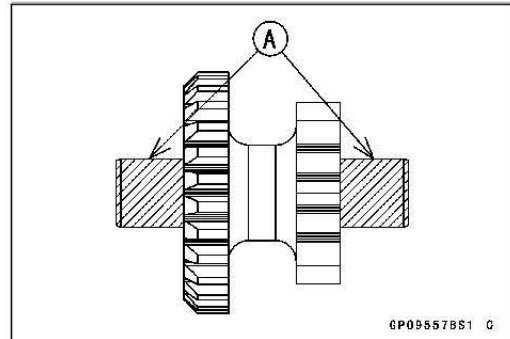
- Install the collar [A] with its stepped side facing out.
- Apply a thin coat of molybdenum disulfide oil solution to the sliding surfaces [B] on the crankshaft.



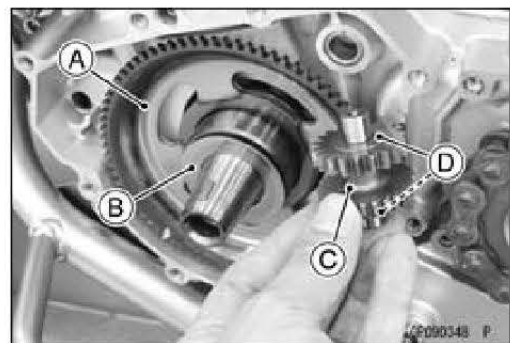
- Apply a thin coat of molybdenum disulfide grease to the idle gear shafts [A].

NOTE

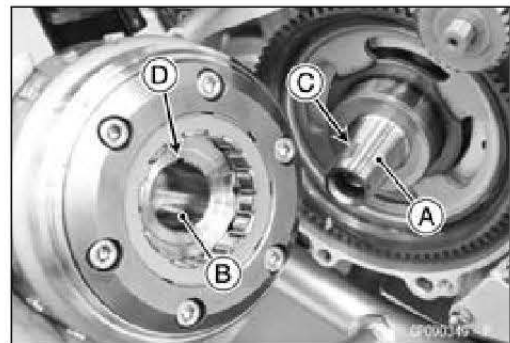
○ The idler gear should be installed with the larger gear facing out.



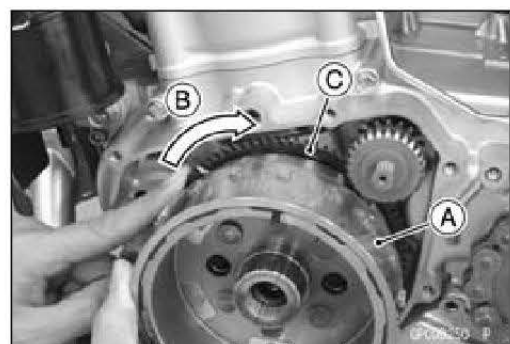
- Install:
 - Starter Motor Clutch Gear [A]
 - Washer [B]
 - Idle Gear [C] with Washers [D]



- Using a cleaning fluid, clean off any oil or dirt on the following portions and dry them with a clean cloth.
 - Crankshaft Tapered Portion [A]
 - Alternator Rotor Tapered Portion [B]
- Install the woodruff key [C] into the slot of the crankshaft securely.
- Fit the groove [D] to the woodruff key.



- Install the alternator rotor [A] while turning [B] the starter motor clutch gear [C] clockwise.



Charging System

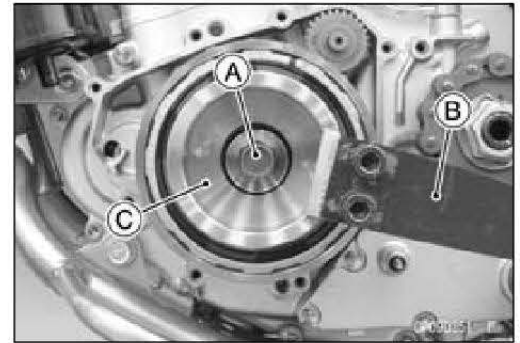
NOTE

○Confirm the alternator rotor fit or not to the crankshaft before tightening it with specified torque.

- Install the rotor bolt [A] and tighten it with 80 N·m (8.2 kgf·m, 59 ft·lb) of torque.

Special Tools - Grip [B]: 57001-1591

Rotor Holder [C]: 57001-1723



- Remove the rotor bolt.
- Check the tightening torque with a bolt [A] of the below specification.
Bolt - M20 × 1.5, Threads length is about 45 mm (1.8 in.)

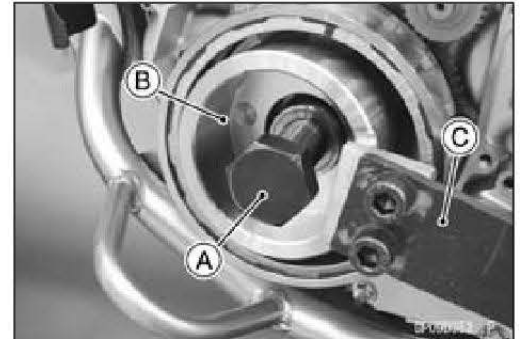
Special Tools - Rotor Holder [B]: 57001-1723

Grip [C]: 57001-1591

- The bolt of the above specification is included in the Rotor Puller of the special tool.

Special Tool - Rotor Puller: 57001-1623

- ★If the rotor is not pulled out with 20 N·m (2.0 kgf·m, 15 ft·lb) of drawing torque, it is installed correctly.
- ★If the rotor is pulled out with under 20 N·m (2.0 kgf·m, 15 ft·lb) of drawing torque, clean off any oil dirt or flaw of the crankshaft and rotor tapered portion, and dry them with a clean cloth. Then, confirm that it is not pulled out with above torque.



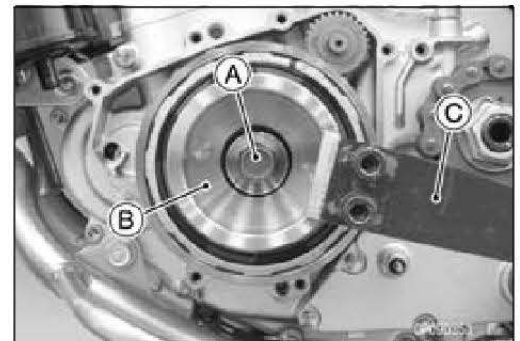
- Tighten the alternator rotor bolt [A] while holding the alternator rotor steadily with the holder [B].

Special Tools - Grip [C]: 57001-1591

Rotor Holder: 57001-1723

Torque - Alternator Rotor Bolt: 135 N·m (13.8 kgf·m, 100 ft·lb)

- Install the alternator cover (see Alternator Cover Installation(16-25)).

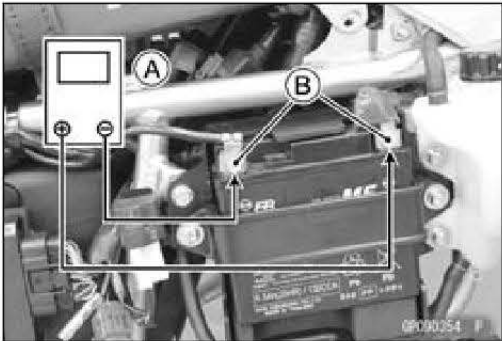


16-30 ELECTRICAL SYSTEM

Charging System

Charging Voltage Inspection

- Check the battery condition (see Charging Condition Inspection(16-21)).
- Warm up the engine to obtain actual alternator operating conditions.
- Check that the ignition switch has been turned off, and connect a tester [A] to the battery terminals [B].
- Start the engine, and note the voltage readings at various engine speeds (except idling engine speed). The readings should show nearly battery voltage when the engine speed is low, and, as the engine speed rises, the readings should also rise. But they must be kept under the specified voltage.



Charging Voltage @25°C (77°F)

Connections		Reading
Tester (+) to	Tester (-) to	
Battery (+)	Battery (-)	DC 14.4 ~ 15.0 V

- Turn off the ignition switch to stop the engine, and disconnect the tester.
- ★ If the charging voltage is kept between the values given in the table, the charging system is considered to be working normally.
- ★ If the charging voltage is much higher than the values specified in the table, the regulator/rectifier is defective or the regulator/rectifier leads are loose or open.
- ★ If the charging voltage does not rise as the engine speed increases, then the regulator/rectifier is defective or the alternator output is insufficient for the loads. Check the alternator and regulator/rectifier to determine which part is defective.

Alternator Inspection

There are three types of alternator failures: short, open (wire burned out), or loss in rotor magnetism. A short or open in one of the coil wires will result in either a low output, or no output at all. A loss in rotor magnetism, which may be caused by dropping or hitting the alternator, by leaving it near an electromagnetic field, or just by aging, will result in low output.

Charging System

- To check the alternator output voltage, do the following procedures.
- Turn the ignition switch off.
- Disconnect the regulator/rectifier connector [A] (see Regulator/Rectifier Removal(16-32)).
- Connect a tester as shown in the table 1.
- Start the engine.
- Run it at the rpm given in the table 1.
- Note the voltage readings (total 3 measurements).

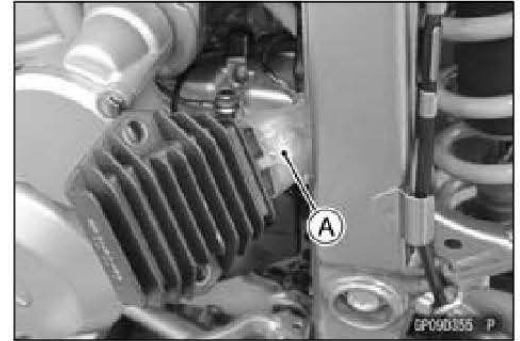


Table 1 Alternator Output Voltage @4 000 r/min (rpm)

Connections		Reading
Tester (+) to	Tester (–) to	
One Yellow lead	Another Yellow lead	AC 39 V or more

- ★ If the output voltage shows the value in the table, the alternator operates properly.
- ★ If the output voltage shows a much lower reading than that given in the table, stop the engine and inspect the stator coil resistance.
- Check the stator coil resistance as follows.
- Stop the engine.
- Connect the tester as shown in the table 2.
- Note the readings (total 3 measurement).

Table 2 Stator Coil Resistance @20°C (68°F)

Connections		Reading
Tester (+) to	Tester (–) to	
One Yellow lead	Another Yellow lead	0.1 ~ 0.8 Ω

When measuring the resistance, use a tester that can measure the standard value.

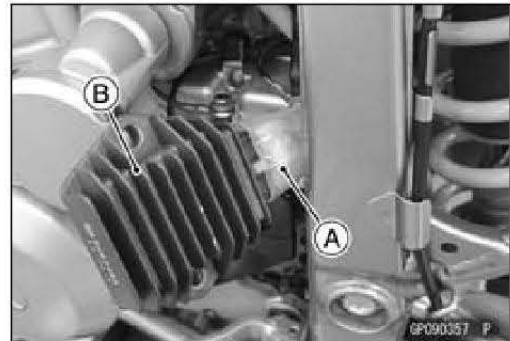
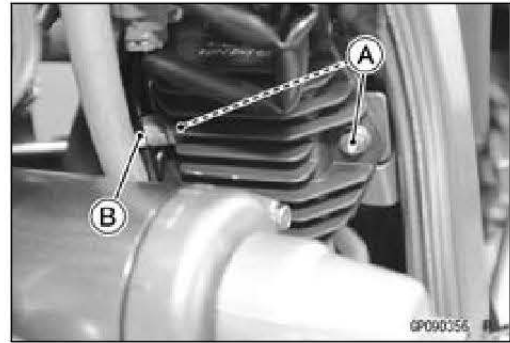
- ★ If there is more resistance than shown in the table, or no tester reading (infinity) for any two leads, the stator has an open lead and must be replaced. Much less than this resistance means the stator is shorted, and must be replaced.
- Measure the resistance between each of the yellow leads and chassis ground.
- ★ Any tester reading less than infinity (∞) indicates a short, necessitating stator replacement.
- ★ If the stator coils have normal resistance, but the voltage check showed the alternator to be defective; then the rotor magnets have probably weakened, and the rotor must be replaced.

16-32 ELECTRICAL SYSTEM

Charging System

Regulator/Rectifier Removal

- Remove:
 - Regulator/Rectifier Bolts [A]
 - Clamp [B]
- Disconnect the connector [A] and remove the regulator/rectifier [B].



Regulator/Rectifier Installation

- Installation is the reverse of removal.

NOTE

○Firstly, connect the connector [A] to the regulator/rectifier securely, then install the regulator/rectifier to the bracket.

- Tighten:
 - Torque - Regulator/Rectifier Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)
- Run the leads correctly (see Cable, Wire, and Hose Routing section (17-2)).



Regulator/Rectifier Inspection

- Refer to the Charging System Troubleshooting shown below.

Charging System Troubleshooting

- Before inspection, remove all accessories that consume electrical power.

NOTE

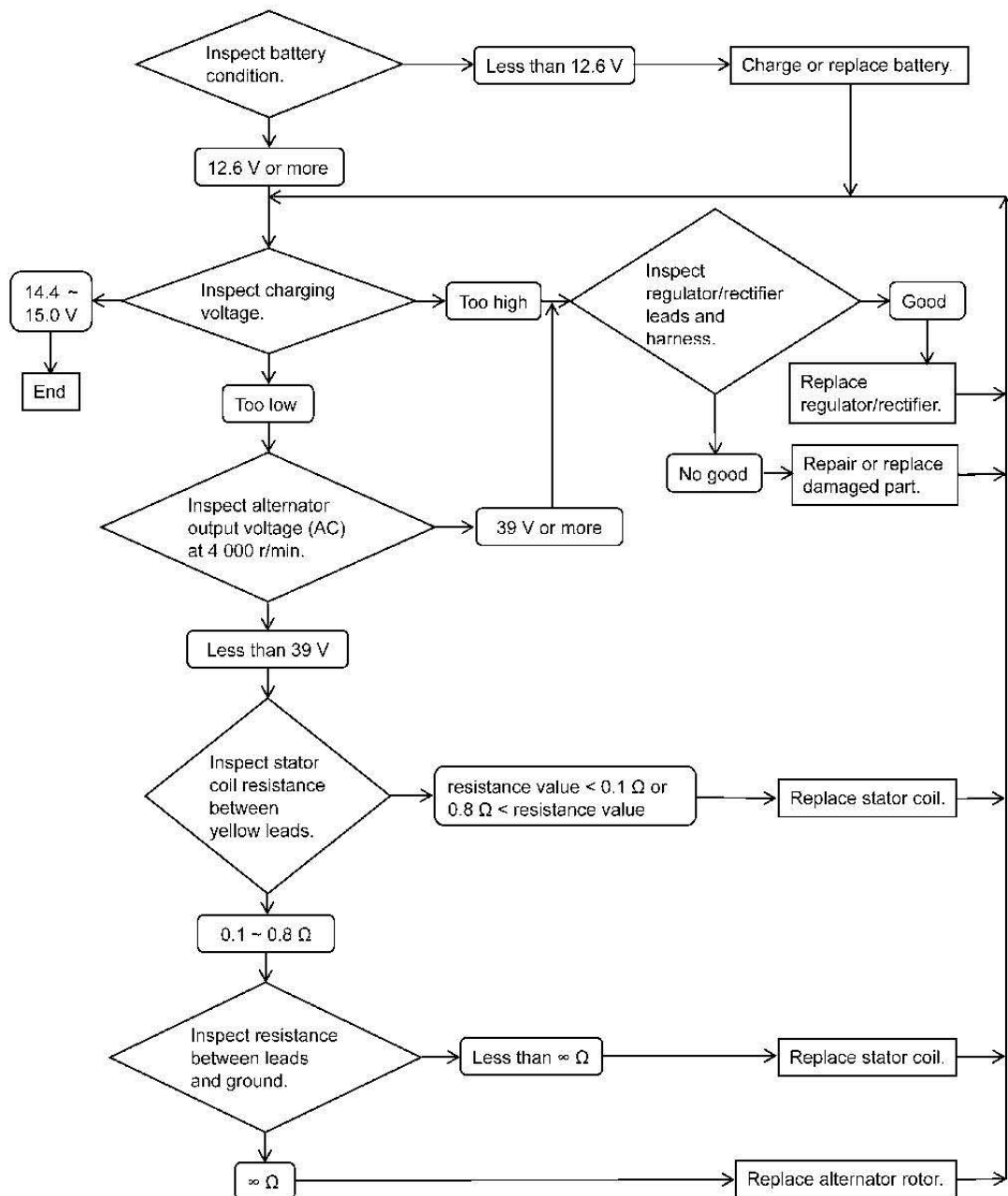
○Even when the charging system is working properly, the battery may discharge if the motorcycle is equipped with too many accessories.

- Pay attention to riding conditions and the customer's riding habits which could affect the charging system such as:

Frequent use at low engine speed → Battery Discharged

- Recharge the battery if it is discharged.

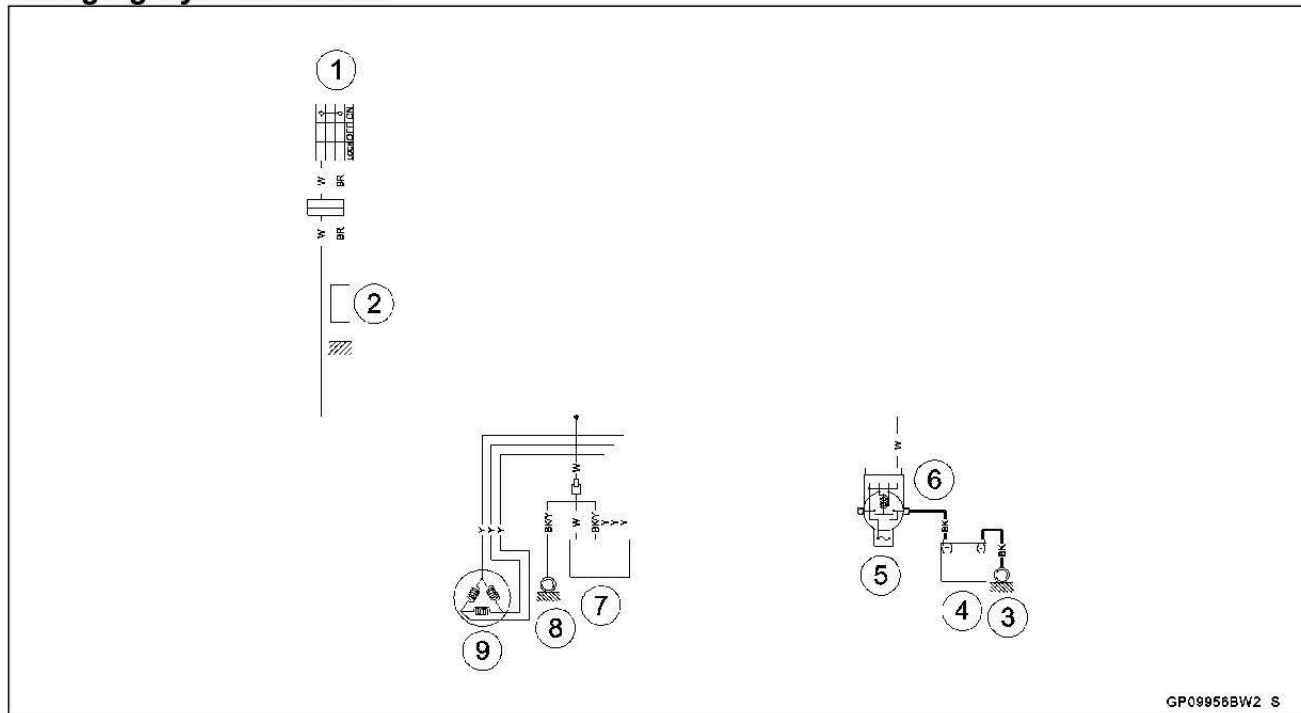
Charging System



16-34 ELECTRICAL SYSTEM

Charging System

Charging System Circuit



GP09956BW2 S

1. Ignition Switch
2. Load
3. Engine Ground
4. Battery
5. Main Fuse 20 A
6. Starter Relay
7. Regulator/Rectifier
8. Engine Ground
9. Alternator

Ignition System

Safety Instructions

WARNING

The ignition system produces extremely high voltage. Do not touch the spark plug, ignition coil or ignition coil lead while the engine is running, or you could receive a severe electrical shock.

NOTICE

Do not disconnect the battery cables or any other electrical connections when the ignition switch is on, or while the engine is running. This is to prevent ECU damage.

Do not install the battery backwards. The negative side is grounded. This is to prevent damage to the ECU.

Ignition Timing Inspection

- Remove:
Timing Inspection Cap [A]
Special Tool - Filler Cap Driver: 57001-1454
- Attach the timing light [A] to the ignition coil lead in the manner prescribed by the manufacturer.
Special Tool - Timing Light: 57001-1794
- Start the engine and aim the timing light at the ignition timing mark on the alternator rotor.
- Run the engine at the speeds specified and note the alignment of the ignition timing mark.

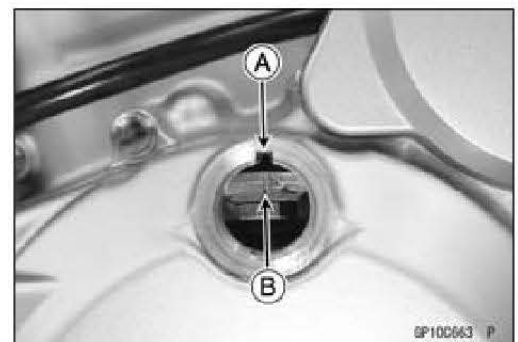
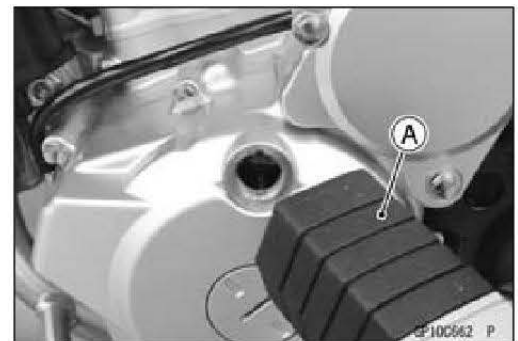
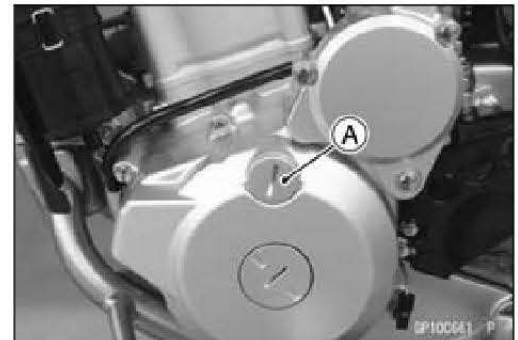
Ignition Timing

Engine speed [r/min (rpm)]	Hole groove [A] aligns with:
Idle Speed to 1 500	F mark [B] on alternator rotor

- ★ If the ignition timing is incorrect, check the crankshaft sensor (see Crankshaft Sensor Inspection(16-36)).
- ★ If the crankshaft sensor is normal, replace the ECU.
- Replace the O-ring with a new one.
- Install:
Timing Inspection Cap

Crankshaft Sensor Removal

- Refer to the Stator Coil Removal (see Stator Coil Removal(16-26)).



16-36 ELECTRICAL SYSTEM

Ignition System

Crankshaft Sensor Installation

- Refer to the Stator Coil Installation (see Stator Coil Installation(16-26)).

Crankshaft Sensor Inspection

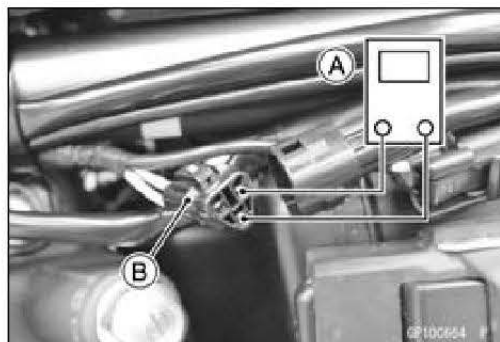
- Disconnect the crankshaft sensor lead connector (see Alternator Cover Removal(16-24)).
- Set a tester [A], and connect it to the crankshaft sensor lead connector [B].

Crankshaft Sensor Resistance

Connections: G/W lead $\longleftrightarrow$ W/Y lead

Standard: 192 ~ 288 Ω @20°C (68°F)

- ★ If there is more resistance than the specified value, the coil has an open lead and must be replaced. Much less than this resistance means the coil is shorted, and must be replaced.
- Measure the resistance between the crankshaft sensor leads and chassis ground.
- ★ Any tester reading less than infinity (∞) indicates a short, necessitating replacement of the crankshaft sensor.



Crankshaft Sensor Peak Voltage Inspection

NOTE

- Be sure the battery is fully charged.
- Using the peak voltage adapter is more reliable way to determine the condition of the crankshaft sensor than crankshaft sensor internal resistance measurements.

- Connect the throttle sensor setting adapter [A] between the crankshaft sensor lead connectors [B].

Special Tool - Throttle Sensor Setting Adapter #1: 57001-1400

- Connect the peak voltage adapter [C] and a tester [D] to the throttle sensor setting adapter leads.

Special Tool - Peak Voltage Adapter: 57001-1415

Type: KEK-54-9-B

Connections:

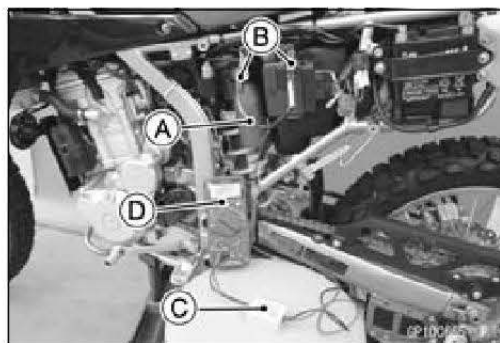
Crankshaft Sensor Lead	Setting Adapter Lead	Peak Voltage Adapter Lead	Tester
G/W lead	BK lead	R lead	(+)
W/Y lead	BL lead	BK lead	(-)

- Turn the ignition switch on.
- Pushing the starter button with the clutch lever pulled in, turn the engine 4 ~ 5 seconds to measure the crankshaft sensor peak voltage.
- Repeat the measurement 5 or more times.

Crankshaft Sensor Peak Voltage

Standard: 3.2 V or more

- ★ If the reading is less than the standard, inspect the crankshaft sensor (see Crankshaft Sensor Inspection(16-36)).



Ignition System

Ignition Coil Removal

- Remove:
Fuel Tank (see Fuel Tank Removal(3-113))
- Pull off the spark plug cap [A] from the spark plug.

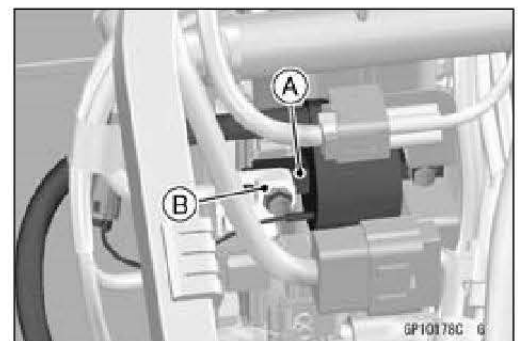
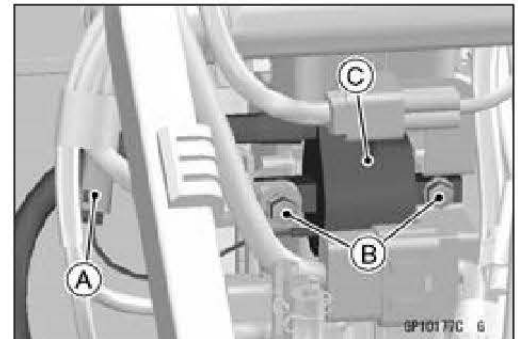
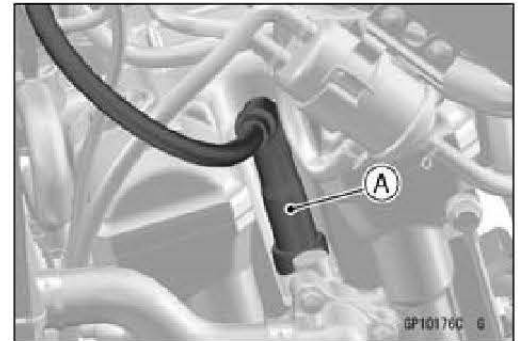
NOTICE

When removing the spark plug cap, do not pull the lead. The lead could be broken off or damaged the wires inside.

- Disconnect:
Ignition Coil Primary Connector [A]
- Remove:
Ignition Coil Bolts [B]
Ignition Coil [C]

Ignition Coil Installation

- Set the ignition coil ground lead terminal [A] first, and install the ground terminal [B].
- Tighten:
Torque - Ignition Coil Bolts: 5.9 N·m (0.60 kgf·m, 52 in·lb)
- Run the leads correctly (see Cable, Wire, and Hose Routing section (17-2)).
- Install the removed parts.



16-38 ELECTRICAL SYSTEM

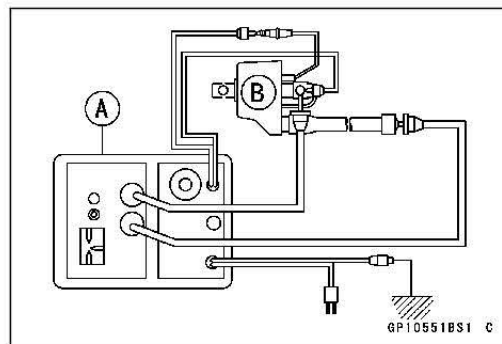
Ignition System

Ignition Coil Inspection

- Remove the ignition coil (see Ignition Coil Removal(16-37)).
- Measure the arcing distance with a suitable commercially available coil tester [A] to check the condition of the ignition coil [B].
- Connect the ignition coil (with the spark plug cap left attached) to the tester in the manner prescribed by the manufacturer and measure the arcing distance.

Ignition Coil Arcing Distance

6 mm (0.24 in.) or more



WARNING

To avoid extremely high voltage shocks, do not touch the coil or high tension lead.

- ★ If the distance reading is less than the specified value, the ignition coil or spark plug cap is defective.
- To determine which part is defective, measure the arcing distance again with the spark plug cap removed from the ignition coil.
- ★ If the arcing distance is subnormal as before, the trouble is with the ignition coil itself. If the arcing distance is now normal, the trouble is with the spark plug cap.
- ★ If the arcing tester is not available, the coil can be checked for a broken or badly shorted winding with a digital meter.

NOTE

○ The digital meter can not detect layer shorts and shorts resulting from insulation breakdown under high voltage.

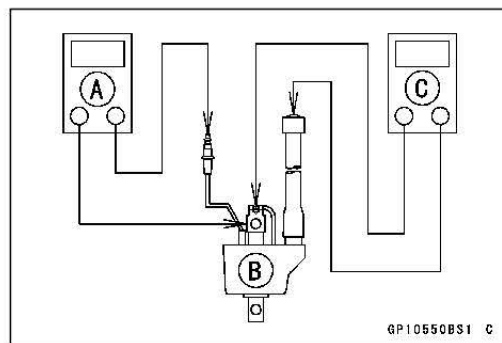
- Measure the primary winding resistance [A] as follows.
Ignition Coil [B]
- Connect the digital meter between the primary terminals.
- Measure the secondary winding resistance [C] as follows:
- Remove the spark plug cap by turning it counterclockwise.
- Connect the digital meter between the spark plug lead and ignition coil negative (–) terminal.

Ignition Coil [B] Winding Resistance

Primary windings: 0.16 ~ 0.24 Ω @20°C (68°F)

Secondary windings: 5.0 ~ 7.6 k Ω @20°C (68°F)

- ★ If the meter does not read as specified, replace the coil.
- ★ If the meter reads as specified, the ignition coil windings are probably good. However, if the ignition system still does not perform as it should after all other components have been checked, replace the coil with one known to be good.
- Check the spark plug lead for visible damage.
- ★ If the spark plug lead is damaged, replace the coil.
- Before installing the spark plug cap, apply a thin coat of grease to the end of spark plug lead.



Ignition System

Ignition Coil Primary Peak Voltage Inspection

NOTE

○Be sure the battery is fully charged.

- Remove:
 - Left Shroud (see Shroud Removal(15-10))
- Pull off the spark plug cap from the spark plug (see Ignition Coil Removal(16-37)).
- Do not remove the spark plug.
- Measure the primary peak voltage as follows.
- Install the new spark plug [A] into the plug cap, and ground it onto the engine.
- Connect the peak voltage adapter [B] into a tester and connect its terminals to the ignition coil [C] lead and ground.

Special Tools - Peak Voltage Adapter: 57001-1415

Type: KEK-54-9-B

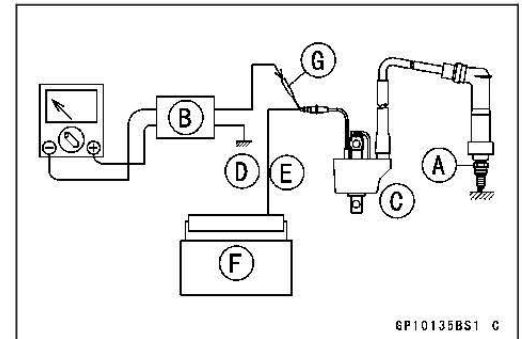
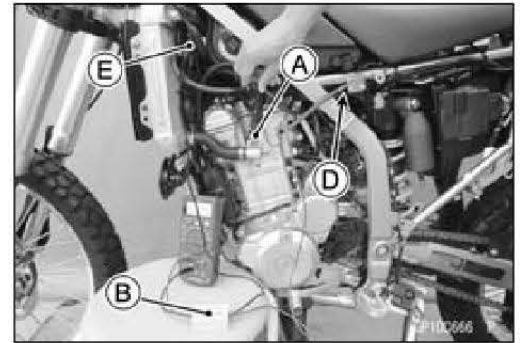
Needle Adapter Set: 57001-1874

Connections:

- Adapter (R, +) → Ground [D]
- Adapter (BK, -) → BK/W Lead Terminal [E]
- ECU [F]
- Needle Adapter [G]

NOTE

○Measure the voltage with each lead connected correctly. The correct value may not be obtained if disconnected.



6P10135BS1 C

WARNING

To avoid extremely high voltage shocks, do not touch the spark plug or tester connections.

- Turn the engine stop switch to run position.
- Turn the ignition switch on.
- Pushing the starter button, turn the engine 4 ~ 5 seconds with the transmission in neutral to measure the primary peak voltage.
- Repeat the measurements 5 times or more times.

Ignition Coil Primary Peak Voltage

Standard: 120 V or more

- ★ If the reading is less than the standard, check the ignition coil (see Ignition Coil Inspection(16-38)).
- ★ If the ignition coil is good, check the other parts (see Ignition System Troubleshooting(16-41)).

Spark Plug Removal

- Refer to the Spark Plug Replacement (see Spark Plug Replacement(2-58)).

Spark Plug Installation

- Refer to the Spark Plug Replacement (see Spark Plug Replacement(2-58)).

16-40 ELECTRICAL SYSTEM

Ignition System

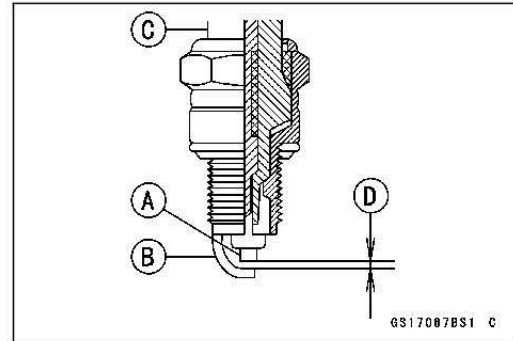
Spark Plug Cleaning and Inspection

- Remove the spark plug (see Spark Plug Replacement(2-58)).
- Clean the spark plug, preferably in a sandblasting device, and then clean off any abrasive particles. The plug may also be cleaned using a high flash-point solvent and a nonmetal brush (nylon etc.).
- ★ If the spark plug center electrode [A] and/or side electrode [B] are corroded or damaged, or if the insulator [C] is cracked, replace the plug.
- Use the standard spark plug or its equivalent.

Spark Plug: NGK CR8E

- Measure the gap [D] with a wire-type thickness gauge.
- ★ If the gap is incorrect, carefully bend the side electrode with a tool to obtain the correct gap.

Spark Plug Gap: 0.7 ~ 0.8 mm (0.028 ~ 0.031 in.)



Interlock Operation Inspection

- Raise the rear wheel off the ground with a suitable stand or jack.

Special Tool - Jack: 57001-1238

1st Check

- Start the engine to the following conditions.

Condition:

Transmission Gear → 1st Position

Clutch Lever → Release

- Turn the ignition switch on and push the starter button.
- Then the starter motor should not turn when the starter system circuit is normality.
- ★ If the engine is start, inspect the starter lockout switch, neutral switch and diode.

2nd Check

- Start the engine to the following conditions.

Condition:

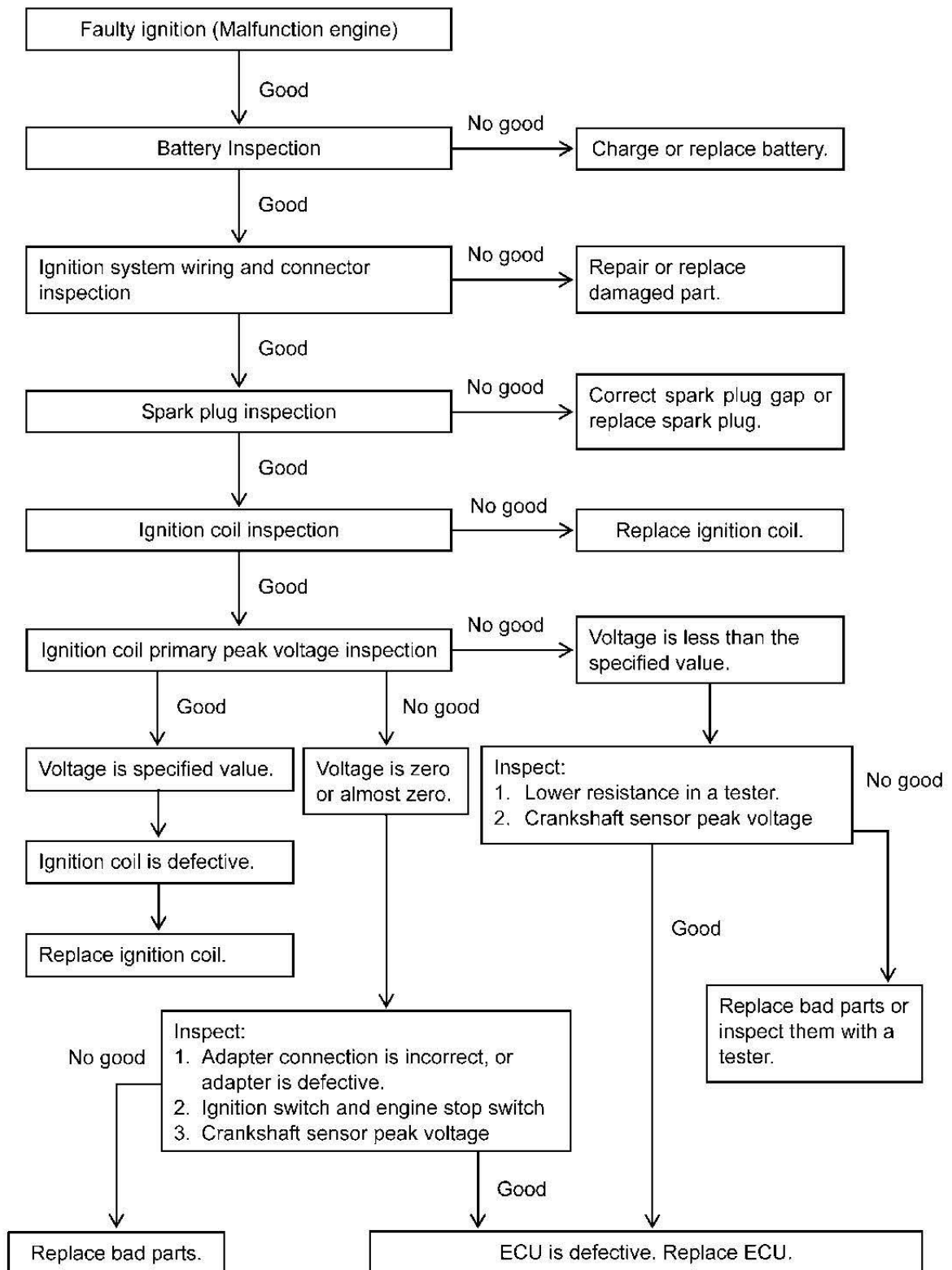
Transmission Gear → 1st Position

Clutch Lever → Pulled in

- Turn the ignition switch on and push the starter button.
- Then the starter motor should turn when the starter system circuit is normality.
- ★ If the starter motor is not turn, inspect the starter lockout switch, diode, and starter relay.
- ★ If their parts are normality, replace the ECU.

Ignition System

Ignition System Troubleshooting

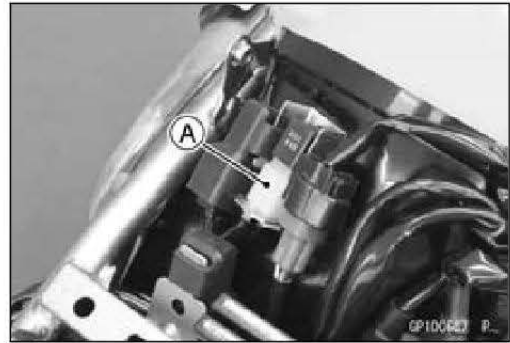


16-42 ELECTRICAL SYSTEM

Ignition System

Interlock Diode Unit Inspection

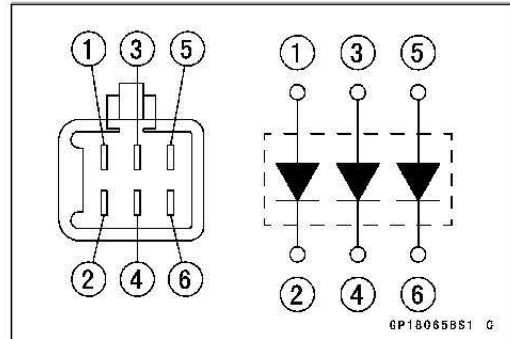
- Remove:
 - Seat (see Seat Removal (15-7))
 - Interlock Diode Unit [A]



- Connect a digital meter to the diode unit terminals to check the resistance in both directions.
- ★ The resistance should be low in one direction and more than ten times as much in the other direction. If any diode shows low or high in both directions, the diode is defective and the diode unit must be replaced.

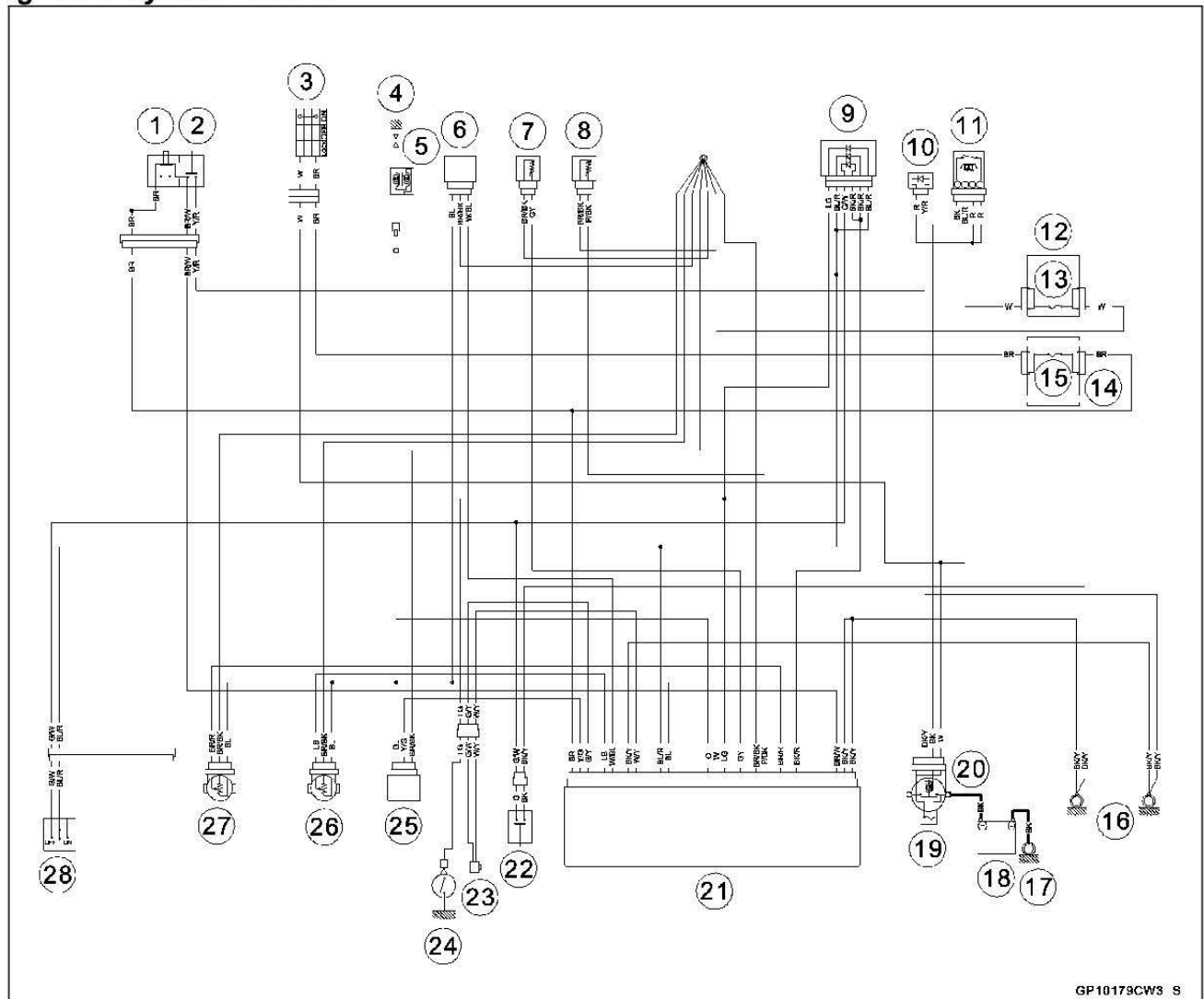
NOTE

- The actual meter reading varies with the meter used and the individual diode, but, generally speaking, the lower reading should be from the zero to one half the scale.



Ignition System

Ignition System Circuit



GP10179CW3 S

- | | |
|----------------------------------|----------------------------|
| 1. Engine Stop Switch | 15. Ignition Fuse 10 A |
| 2. Starter Button | 16. Frame Grounds |
| 3. Ignition Switch | 17. Engine Ground |
| 4. Spark Plug | 18. Battery |
| 5. Ignition Coil | 19. Main Fuse 20 A |
| 6. Intake Air Pressure Sensor | 20. Starter Relay |
| 7. Water Temperature Sensor | 21. ECU |
| 8. Intake Air Temperature Sensor | 22. Side Stand Switch |
| 9. Interlock Diode Unit | 23. Crankshaft Sensor |
| 10. Diode | 24. Neutral Switch |
| 11. Starter Circuit Relay | 25. Vehicle-down Sensor |
| 12. Fuse Box (1) | 26. Main Throttle Sensor |
| 13. ECU Fuse 15 A | 27. Subthrottle Sensor |
| 14. Fuse Box (2) | 28. Starter Lockout Switch |

16-44 ELECTRICAL SYSTEM

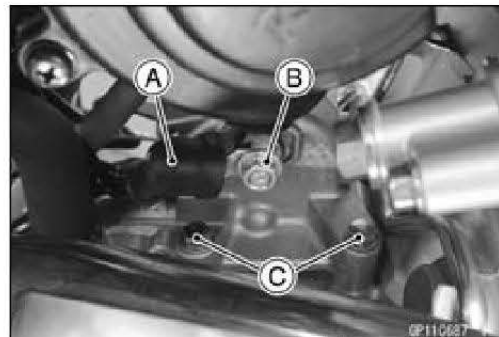
Electric Starter System

Starter Motor Removal

NOTICE

Do not tap the starter motor shaft or body. Tapping the shaft or body could damage the motor.

- Slide back the rubber cap [A].
- Remove:
 - Starter Motor Cable Nut [B]
 - Starter Motor Mounting Bolts [C]



- Pull out the starter motor [A] to the right side and turn the starter as shown.
- Remove the starter motor to the left side.

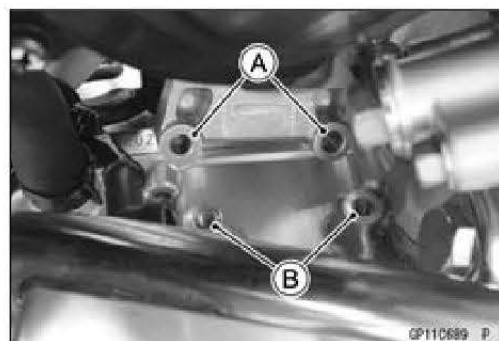


Starter Motor Installation

NOTICE

Do not tap the starter motor shaft or body. Tapping the shaft or body could damage the motor.

- When installing the starter motor, clean the starter motor legs [A] and crankcase [B] where the starter motor is grounded.



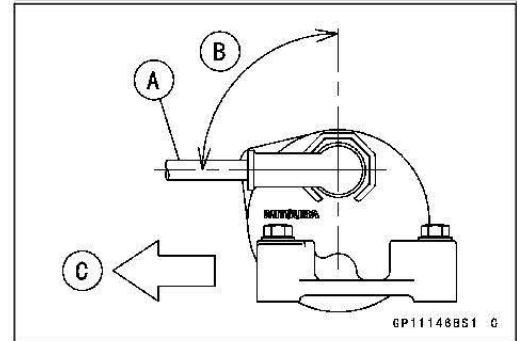
- Replace the O-ring [A] with a new one.
- Apply grease to the O-ring.
- Tighten:

Torque - Starter Motor Mounting Bolts: 9.8 N·m (1.0 kgf·m, 87 in·lb)



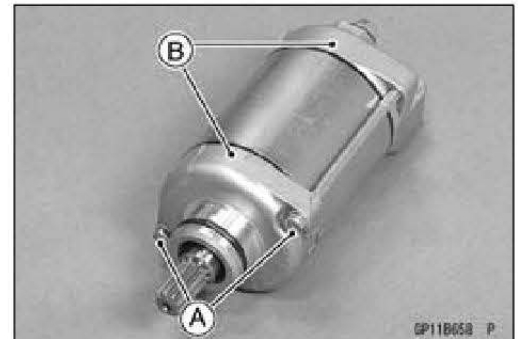
Electric Starter System

- Position the starter motor cable [A] as shown.
90° [B]
Rear [C]
- Tighten:
Torque - Starter Motor Cable Nut: 9.8 N·m (1.0 kgf·m, 87 in·lb)
- Slide back the rubber cap to the original position.



Starter Motor Disassembly

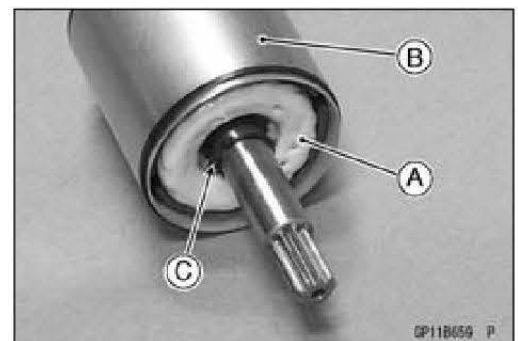
- Remove the starter motor (see Starter Motor Removal(16-44)).
- Take off the starter motor through bolts [A] and remove the both end covers [B].



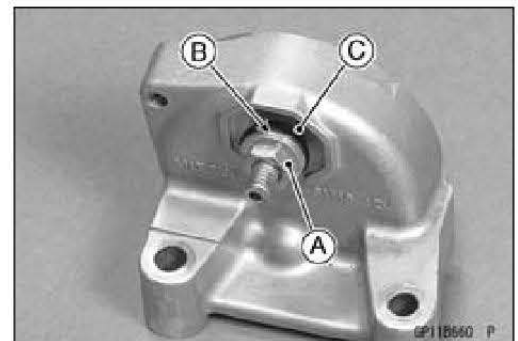
- Pull out the armature [A] out of the yoke [B].

NOTE

○Do not remove the circlip [C] from the shaft.



- Remove:
Starter Motor Terminal Locknut [A]
Washer [B]
Collar [C]



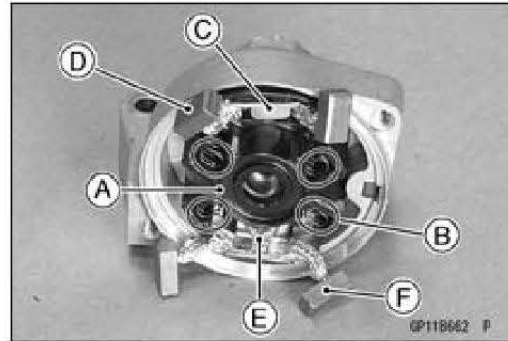
- Remove:
O-ring [A]



16-46 ELECTRICAL SYSTEM

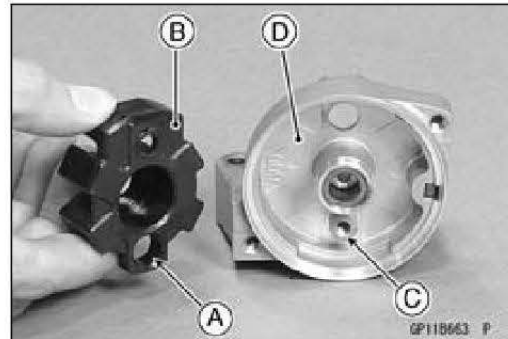
Electric Starter System

- Pull out the brushes from the brush holder [A].
- Remove:
 - Brush Springs [B]
 - Starter Motor Terminal [C]
 - Positive Brush Assy [D]
 - Brush Holder Screw [E]
 - Negative Brush Assy [F]
 - Brush Holder



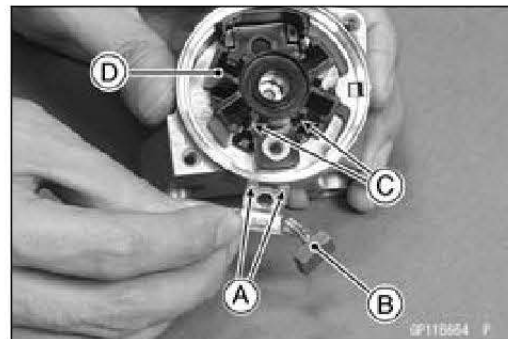
Starter Motor Assembly

- Align the hole [A] of the brush holder [B] to the boss [C] of the right-hand end cover [D].

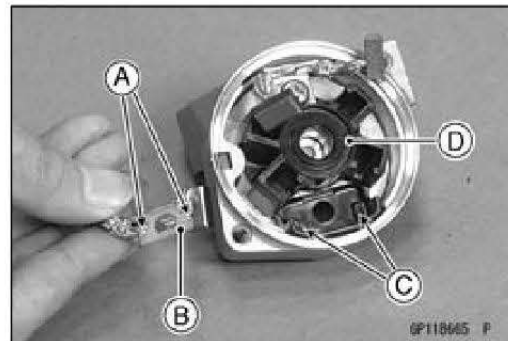


- Align the projections [A] of the negative brush assy [B] to the stoppers [C] of the brush holder [D].
- Tighten:

Torque - Brush Holder Screw: 3.8 N·m (0.39 kgf·m, 34 in·lb)

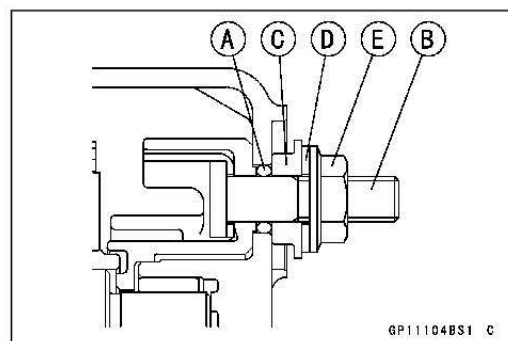


- Align the stoppers [A] of the positive brush assy [B] to the grooves [C] of the brush holder [D].
- Install the starter motor terminal.



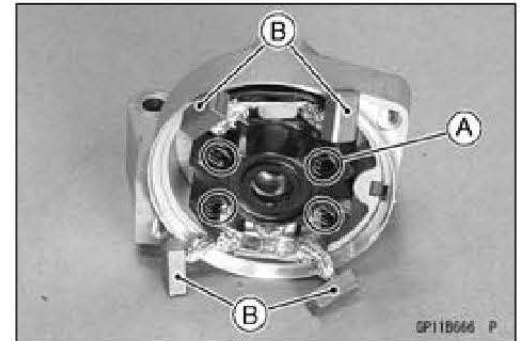
- Replace the O-ring [A] with a new one.
- Install the following parts to the starter motor terminal [B].
 - O-ring
 - Collar [C]
 - Washer [D]
 - Starter Motor Terminal Locknut [E]
- Install the collar so that stepped side faces outward.
- Tighten:

Torque - Starter Motor Terminal Locknut: 11 N·m (1.1 kgf·m, 97 in·lb)



Electric Starter System

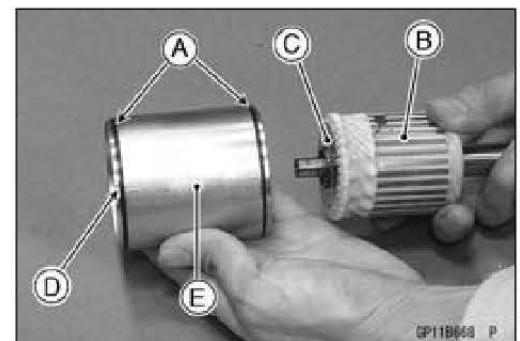
- Install the brush springs [A] and insert the brushes [B].



- Apply thin coat of grease to the oil seal [A].



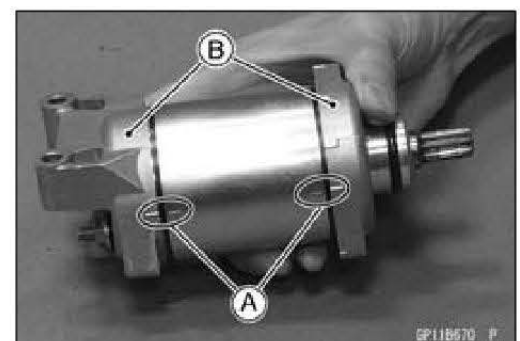
- Replace the O-rings [A] with new ones.
- Insert the armature [B] so that commutator side [C] faces hollow side [D] of the yoke [E].



- Align the stopper [A] of the right-hand end cover to the groove [B] of the yoke.



- Align the marks [A] to assembly the yoke and the end covers [B].



16-48 ELECTRICAL SYSTEM

Electric Starter System

- Tighten:

Torque - Starter Motor Through Bolts [A]: 5.0 N·m (0.51 kgf·m, 44 in·lb)



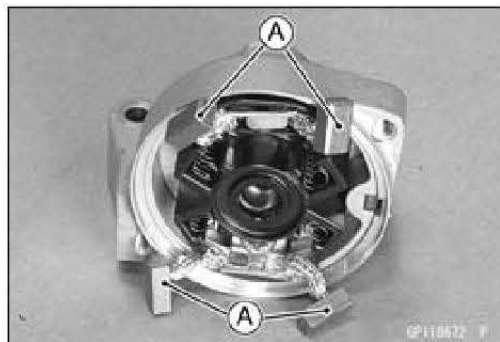
Brush Inspection

- Measure the length of each brush [A].
- ★ If any is worn down to the service limit, replace the brush assy.

Starter Motor Brush Length

Standard: 12 mm (0.47 in.)

Service Limit: 6.5 mm (0.26 in.)



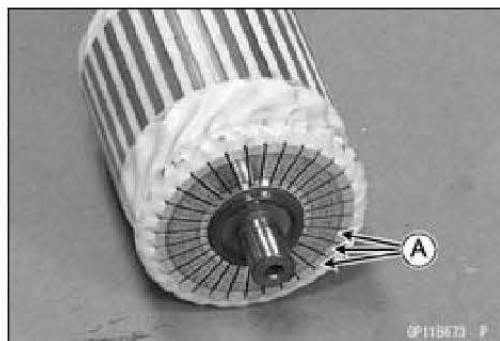
Commutator Cleaning and Inspection

- Clean the metallic debris off the between commutator segments [A].

NOTE

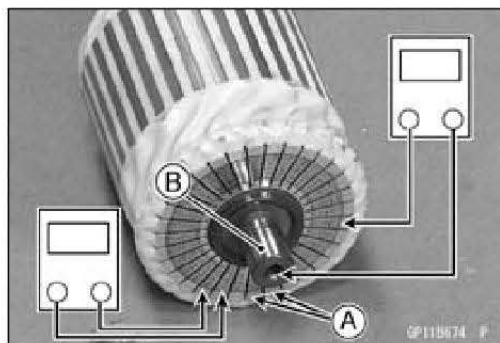
○ Do not use emery or sand paper on the commutator.

- Check the commutator for damage or abnormal wear.
- ★ Replace the starter motor with a new one if there is any damage or wear.
- Visually inspect the commutator segments for discoloration.
- ★ Replace the starter motor with a new one if discoloration is noticed.



Armature Inspection

- Using a tester, measure the resistance between any two commutator segments [A].
- ★ If there is a high resistance or no reading (∞) between any two segments, a winding is open and the starter motor must be replaced.
- Using the highest tester range, measure the resistance between the segments and the shaft [B].
- ★ If there is any reading at all, the armature has a short and the starter motor must be replaced.



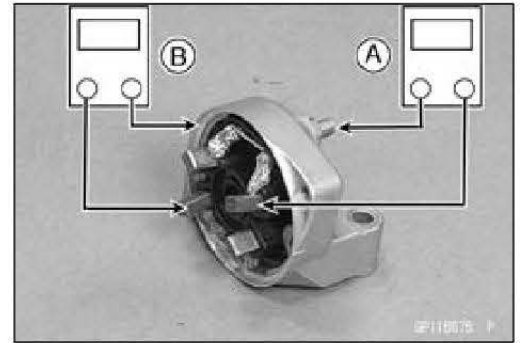
NOTE

○ Even if the foregoing checks show the armature to be good, it may be defective in some manner not readily detectable with the tester. If all other starter motor and starter motor circuit components check good, but the starter motor still does not turn over or only turns over weakly, replace the starter motor with a new one.

Electric Starter System

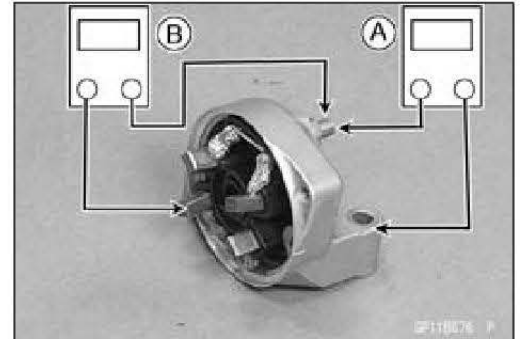
Brush Lead Inspection

- Using a tester, measure the resistance as shown.
Terminal Bolt and Positive Brushes [A]
- Right-hand End Cover and Negative Brushes [B]
- ★ If there is not close to zero ohms, the brush lead has an open. Replace the brush plate assy.



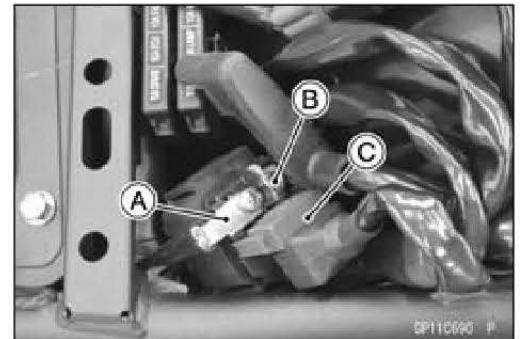
End Cover Inspection

- Using the highest tester range, measure the resistance as shown.
Terminal Bolt and End Cover [A]
- Terminal Bolt and Negative Brushes [B]
- ★ If there is any reading, the brush assy and/or terminal bolt assy have a short. Replace the starter motor.



Starter Relay Removal

- Disconnect:
Battery Negative (–) Cable (see Battery Removal(16-20))
- Starter Motor Cable [A]
- Battery Positive (+) Cable [B]
- Connector [C]



- Pull the starter relay [A] off the rubber holder [B].

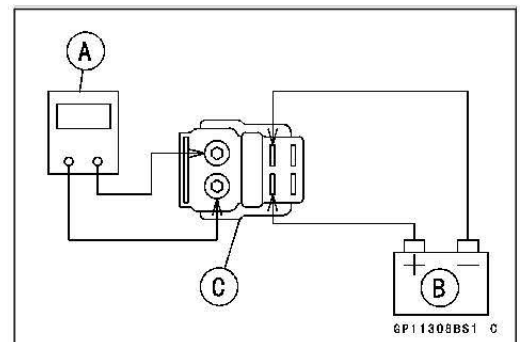


Starter Relay Inspection

- Remove:
Starter Relay (see Starter Relay Removal(16-49))
- Connect a tester [A] and 12 V battery [B] to the starter relay [C] as shown.
- ★ If the relay does not work as specified, the relay is defective. Replace the relay.

Testing Relay

- Criteria:
- | | |
|--------------------------------|-----|
| When battery is connected → | 0 Ω |
| When battery is disconnected → | ∞ Ω |



16-50 ELECTRICAL SYSTEM

Electric Starter System

Starter Circuit Relay Inspection

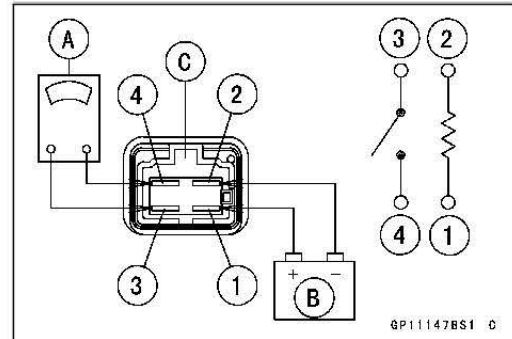
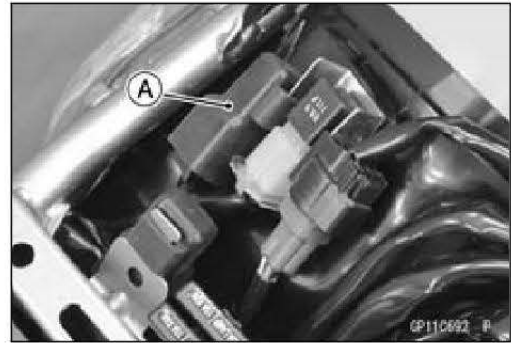
- Remove:
 - Seat (see Seat Removal (15-7))
 - Pull out starter circuit relay [A] from the bracket.
 - Disconnect the connector to remove the relay.
-
- Connect a tester [A] and a 12 V battery [B] to the starter circuit relay [C] as shown.
 - ★ If the relay does not work as specified, the relay is defective. Replace the relay.

Testing Relay

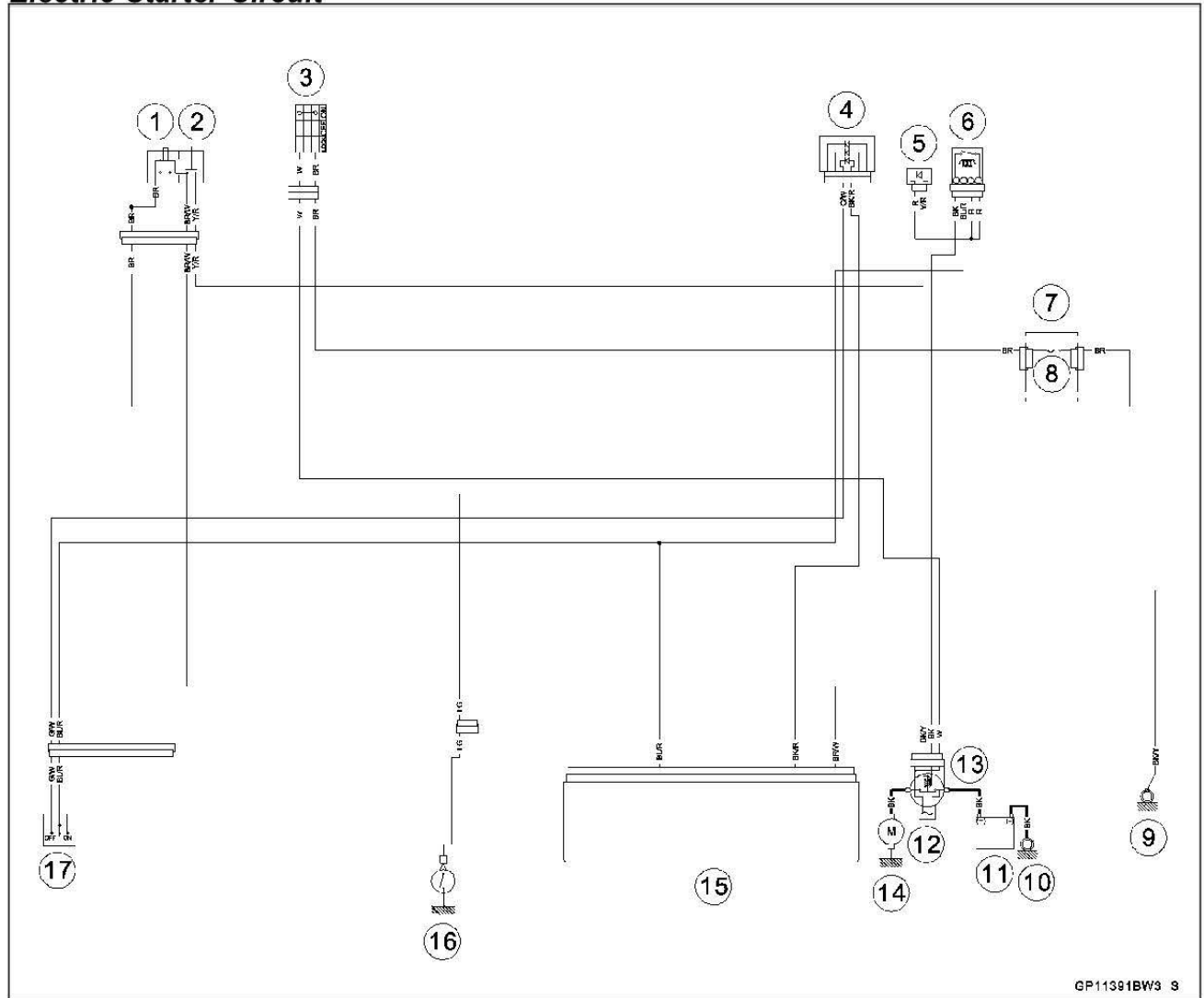
Criteria:

When battery is connected → $0\ \Omega$

When battery is disconnected → $\infty\ \Omega$



Electric Starter System

Electric Starter Circuit

GP11391BW3 3

- | | |
|--------------------------|----------------------------|
| 1. Engine Stop Switch | 10. Engine Ground |
| 2. Starter Button | 11. Battery |
| 3. Ignition Switch | 12. Main Fuse 20 A |
| 4. Interlock Diode Unit | 13. Starter Relay |
| 5. Diode | 14. Starter Motor |
| 6. Starter Circuit Relay | 15. ECU |
| 7. Fuse Box (2) | 16. Neutral Switch |
| 8. Ignition Fuse 10 A | 17. Starter Lockout Switch |
| 9. Frame Ground | |

16-52 ELECTRICAL SYSTEM

Lighting System

Headlight Beam Horizontal Adjustment

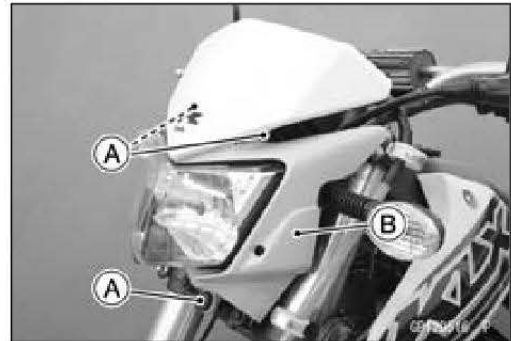
- Refer to the Headlight Aiming Inspection (see Headlight Aiming Inspection(2-56)).

Headlight Beam Vertical Adjustment

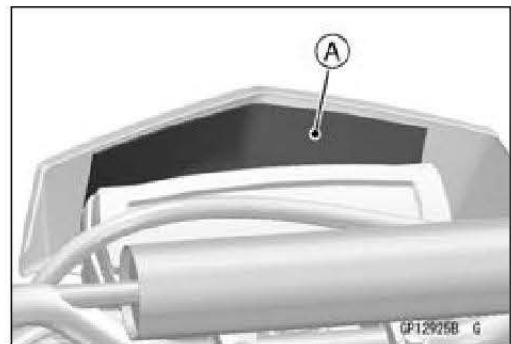
- Refer to the Headlight Aiming Inspection (see Headlight Aiming Inspection(2-56)).

Headlight Removal

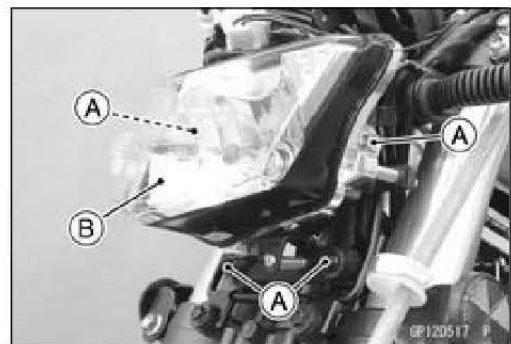
- Remove:
 - Front Fender (see Front Fender Removal(15-11))
 - Bolts [A]
 - Headlight/Meter Cover [B]



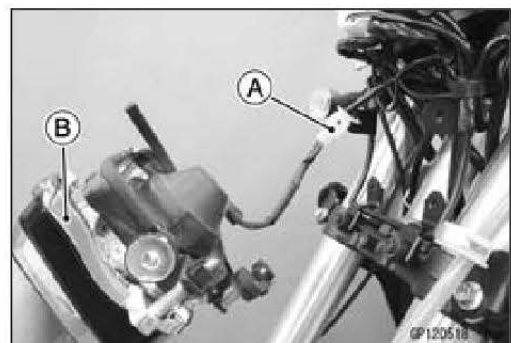
○ Clear the hook fastener [A].



- Remove:
 - Bolts [A]
- Pull the headlight [B] forward.



- Disconnect the headlight connector [A] to remove the headlight [B].

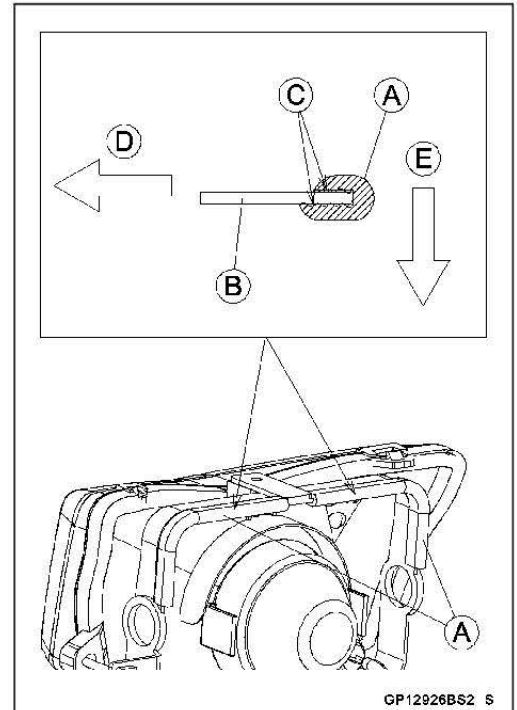


Headlight Installation

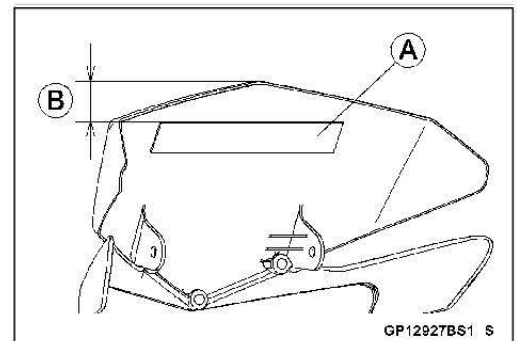
- Installation is the reverse of removal.
- Run the leads correctly (see Cable, Wire, and Hose Routing section (17-2)).

Lighting System

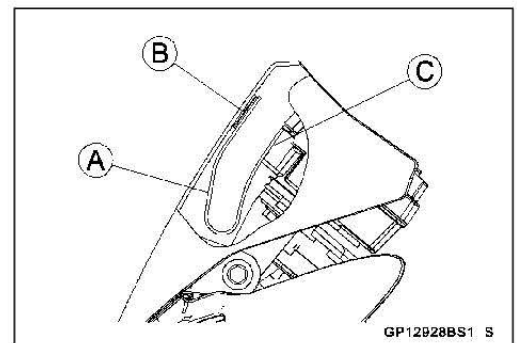
- When installing the trims [A] to the bracket [B], install them as shown.
- Apply adhesive [C] to the inside of the trim.
- Front [D]
- Inner Side [E]



- When sticking the hook fastener tape [A] to the meter cover, stick it as shown.
- 27 mm (1.1 in.) [B]

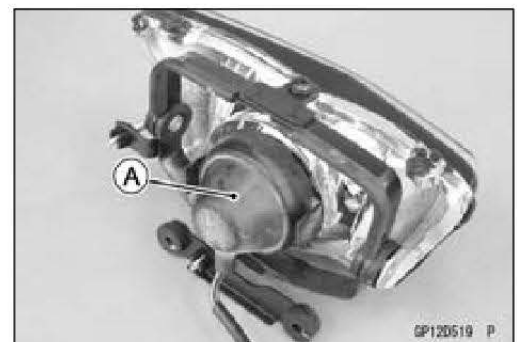


- When sticking the pad [A], stick it as shown.
- Hook Fastener [B]
- Tape [C]



Headlight Bulb Replacement

- Remove the headlight (see Headlight Removal(16-52)).
- Remove the headlight bulb dust cover [A] from the headlight body.



16-54 ELECTRICAL SYSTEM

Lighting System

- Disconnect the connector [A].
- Push the hook [B] to unlock the headlight bulb.
- Remove the bulb [C].

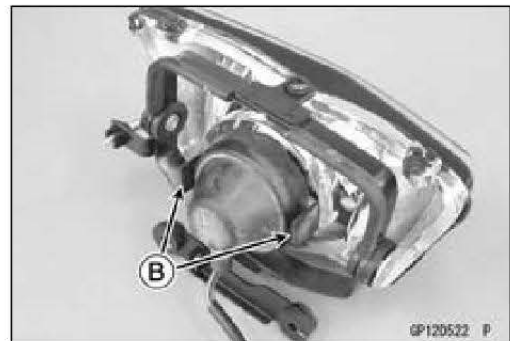
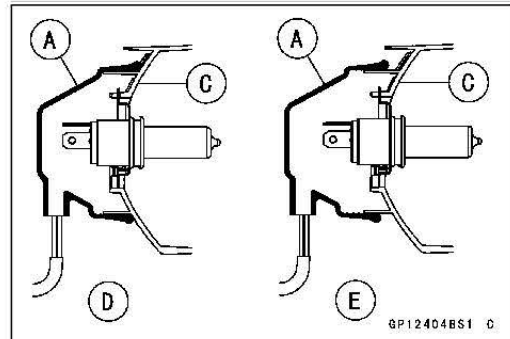
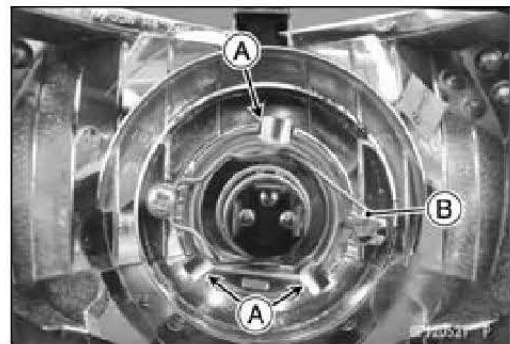
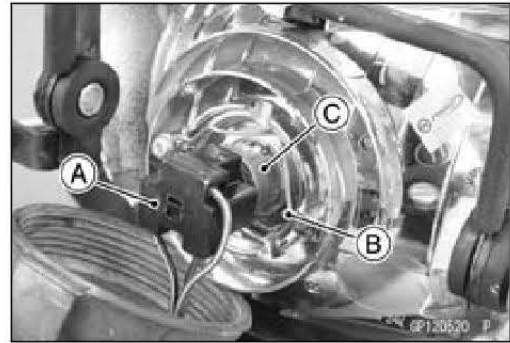
NOTICE

When handling the quartz-halogen bulb, never touch the glass portion with bare hands. Always use a clean cloth. Oil contamination from hands or dirty rags can reduce bulb life or cause the bulb to explode. Use the correct type of headlight bulb with specified voltage and wattage only.

NOTE

○Clean off any contamination that inadvertently gets on the bulb with alcohol or soap and water solution.

- Replace the headlight bulb.
- Fit the projections [A] of the bulb in the hollows of the headlight body.
- Install the hook [B].
- Fit the dust cover [A] with the both knobs [B] sideward onto the headlight body [C] firmly as shown.
Good [D]
Bad [E]
- After installation, adjust the headlight aim (see Headlight Aiming Inspection(2-56)).



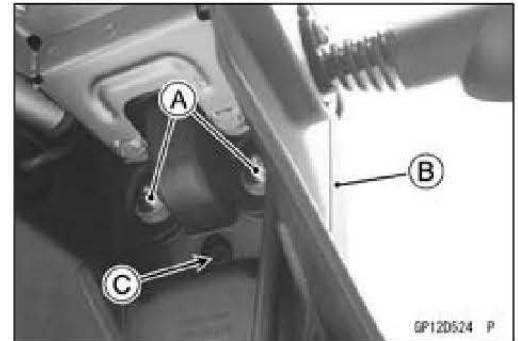
Brake/Tail Light Removal

- Remove:
Rear Frame Cover (see Rear Frame Cover Removal(15-8))
- Disconnect the brake/tail light lead connector [A].



Lighting System

- Remove:
Nuts [A]
- Pull the brake/tail light [B] rearward to clear the projection [C], and remove the battery case.



Brake/Tail Light Installation

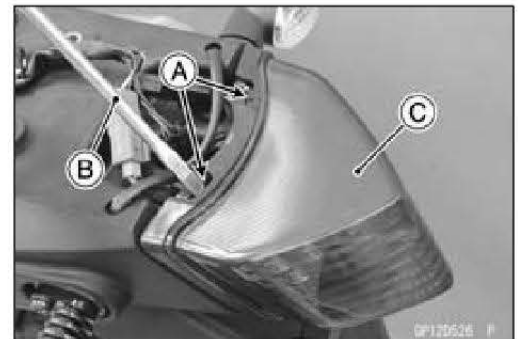
- Installation is the reverse of removal.

Brake/Tail Light Bulb Replacement

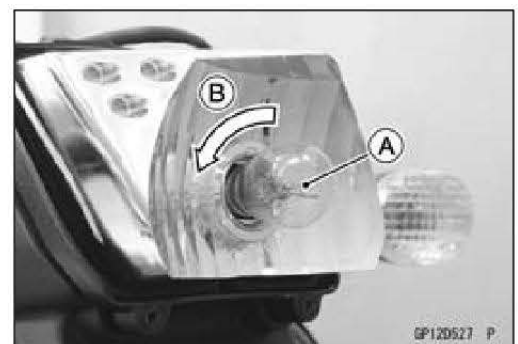
- Remove:
Rear Frame Cover (see [Rear Frame Cover Removal\(15-8\)](#))
Brake/Tail Light Lens Screws [A]



- Clear the stoppers [A] from the brake/tail light body with a flap tip screwdriver [B] to remove the brake/tail light lens [C].



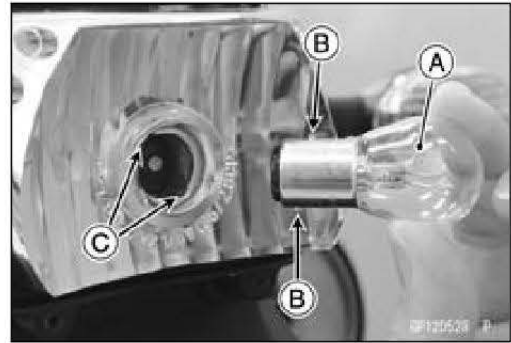
- Push and turn the bulb [A] counterclockwise [B] and remove it.
- Replace the bulb with a new one.



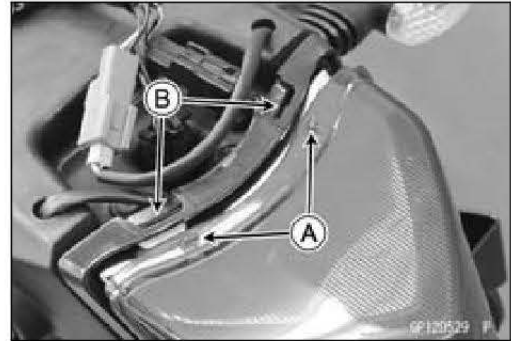
16-56 ELECTRICAL SYSTEM

Lighting System

- Insert the new bulb [A] by aligning its upper and lower pins [B] with the upper and lower grooves [C] in the socket.
- Push and turn the bulb clockwise.

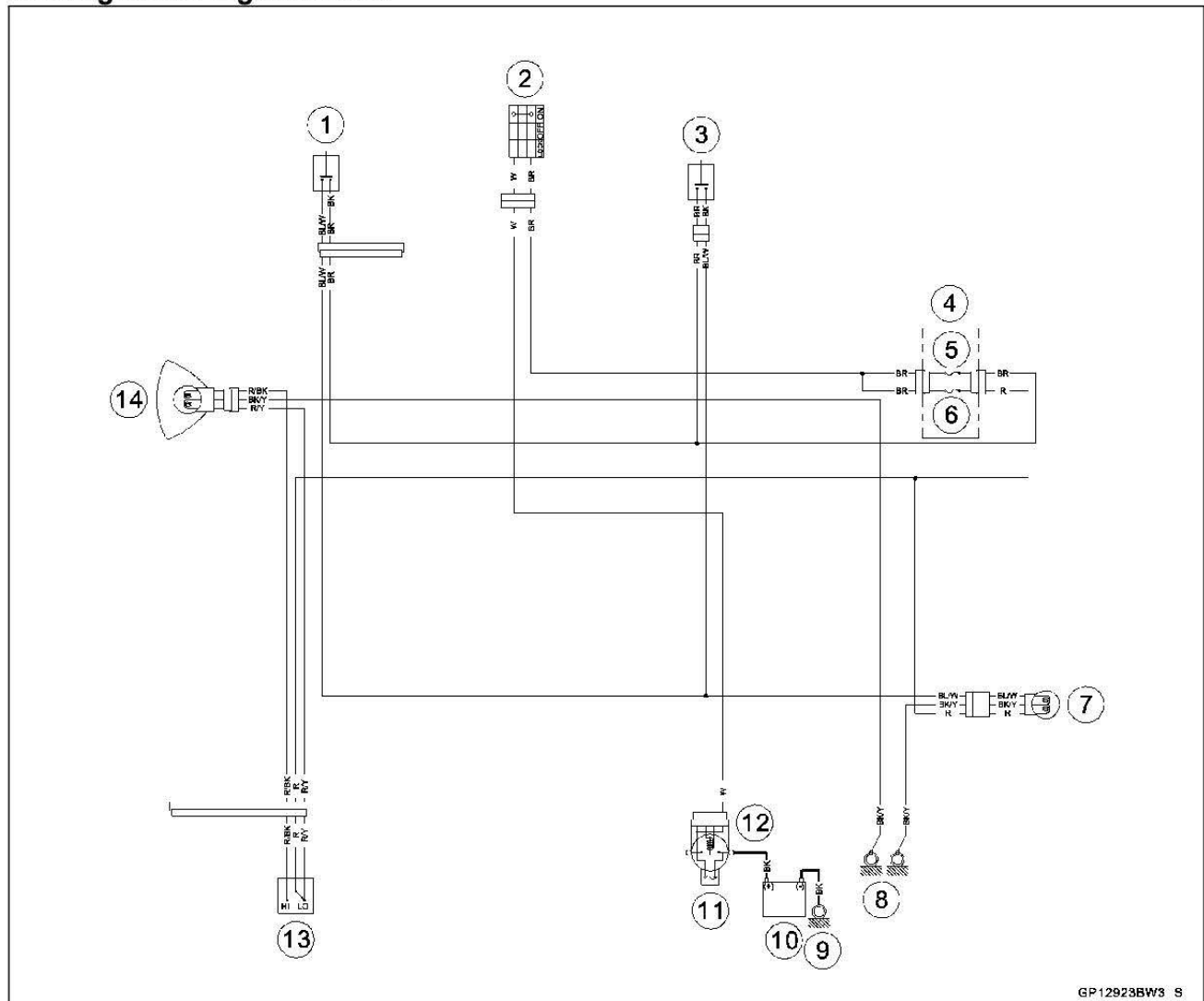


- Install the brake/tail light lens so that the stopper [A] fit the slits [B].
- Tighten:
Torque - Brake/Tail Light Lens Screws: 1.0 N·m (0.10 kgf·m, 8.9 in·lb)



Lighting System

Headlight/Tail Light Circuit

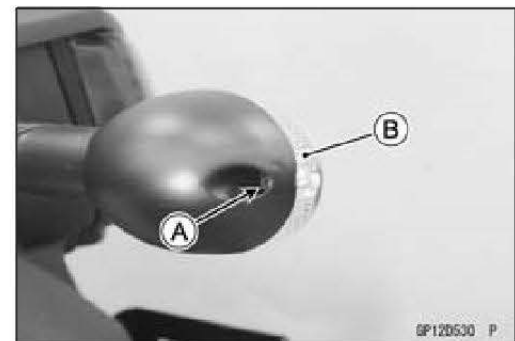


GP12923BW3 S

- | | |
|---------------------------------|----------------------------|
| 1. Front Brake Light Switch | 8. Frame Grounds |
| 2. Ignition Switch | 9. Engine Ground |
| 3. Rear Brake Light Switch | 10. Battery |
| 4. Fuse Box (2) | 11. Main Fuse 20 A |
| 5. Ignition Fuse 10 A | 12. Starter Relay |
| 6. Lighting System Fuse 10 A | 13. Dimmer Switch |
| 7. Brake/Tail Light 12 V 21/5 W | 14. Headlight 12 V 60/55 W |

Turn Signal Light Bulb Replacement

- Remove the screw [A] and take off the turn signal light lens [B].

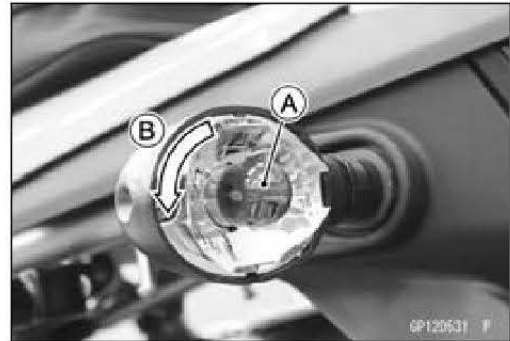


GP120530 P

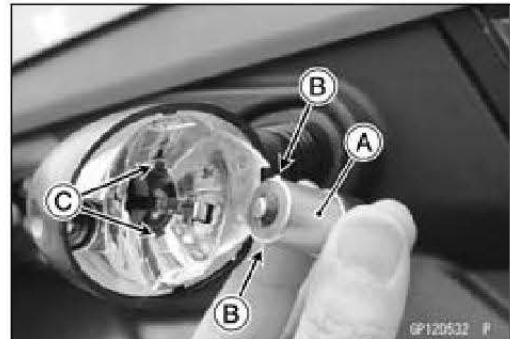
16-58 ELECTRICAL SYSTEM

Lighting System

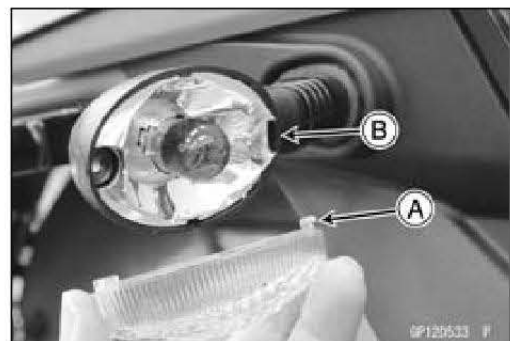
- Push and turn the bulb [A] counterclockwise [B], and remove it.
- Replace the bulb with a new one.



- Insert the new bulb [A] by aligning its upper and lower pins [B] with the upper and lower grooves [C] in the socket, and turn the bulb clockwise.
- Install the turn signal light lens.
- Tighten the turn signal light lens screw. Be careful not to overtighten it.



- Fit the projection [A] of the lens into the groove [B] of the turn signal light.
- Tighten the turn signal light lens screw.

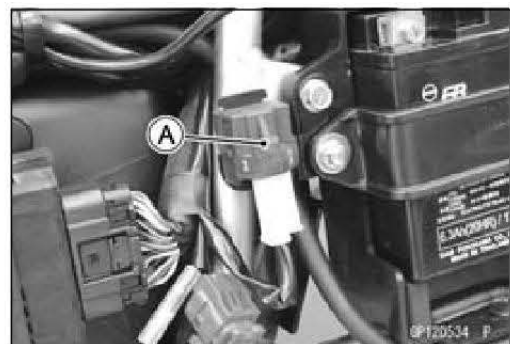


Turn Signal Relay Inspection

NOTICE

Never drop the turn signal relay, especially on a hard surface. Such a shock can damage it.

- Remove:
Seat (see [Seat Removal \(15-7\)](#))
Turn Signal Relay [A]



Lighting System

- Connect one 12 V battery and turn signal lights as indicated, and count how many times the lights blink for one minute.

Turn Signal Relay [A]

Turn Signal Lights [B]

12 V Battery [C]

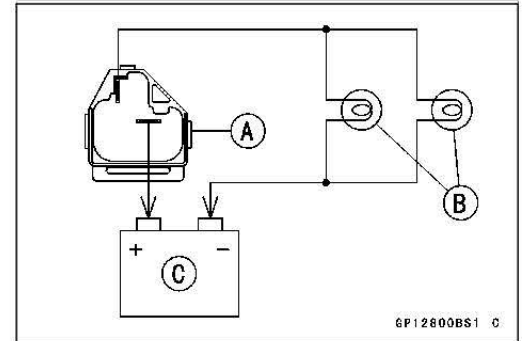
- ★ If the lights do not blink as specified, replace the turn signal relay.

Testing Turn Signal Relay

Load		Blinking Times (c/m*)
The Number of Turn Signal Lights	Wattage (W)	
1**	10	140 or more
2	20	60 ~ 120

(*): Cycle(s) per minute

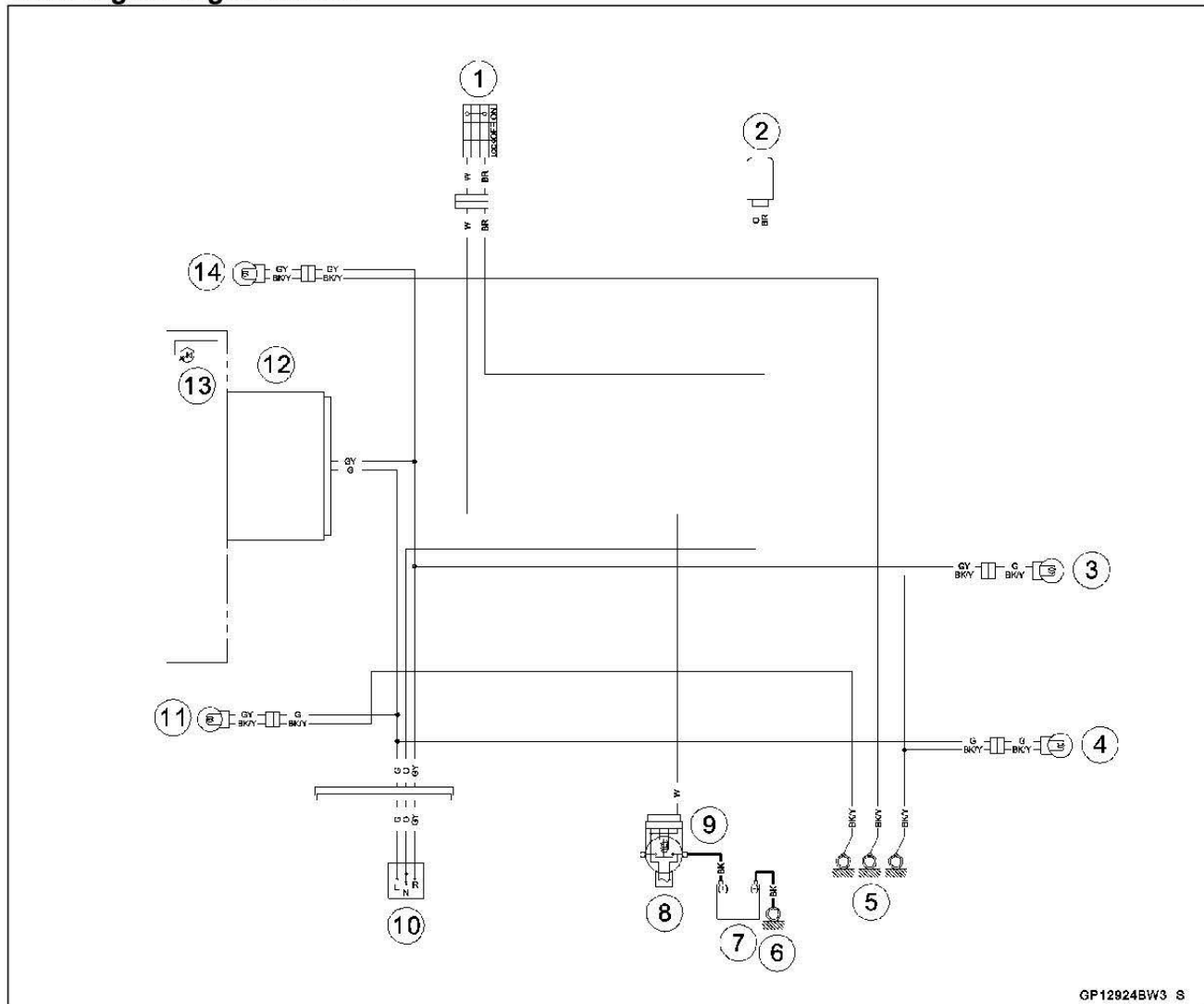
(**): Correspond to "one light burned out."



16-60 ELECTRICAL SYSTEM

Lighting System

Turn Signal Light Circuit



1. Ignition Switch
2. Turn Signal Relay
3. Rear Right Turn Signal Light 12 V 10 W
4. Rear Left Turn Signal Light 12 V 10 W
5. Frame Grounds
6. Engine Ground
7. Battery
8. Main Fuse 20 A
9. Starter Relay
10. Turn Signal Switch
11. Front Left Turn Signal Light 12 V 10 W
12. Meter Unit
13. Green Turn Signal Indicator Light (LED)
14. Front Right Turn Signal Light 12 V 10 W

Air Switching Valve

Air Switching Valve Operation Test

- Refer to the Air Suction System Damage Inspection (see [Air Suction System Damage Inspection\(2-32\)](#)).

Air Switching Valve Unit Test

- Remove the air switching valve (see [Air Switching Valve Removal\(5-13\)](#)).
- Connect a digital meter [A] to the air switching valve terminals as shown.

Air Switching Valve Resistance

Standard: 24 ~ 28 Ω at 20°C (68°F)

- ★ If the resistance reading is except the specified value, replace it with a new one.

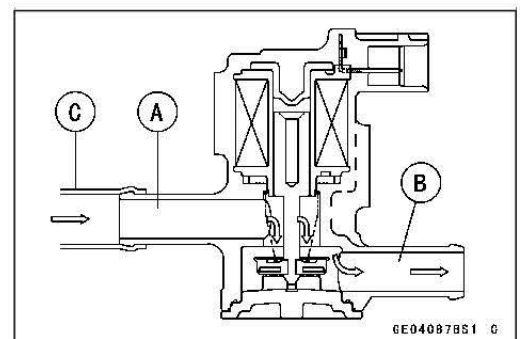
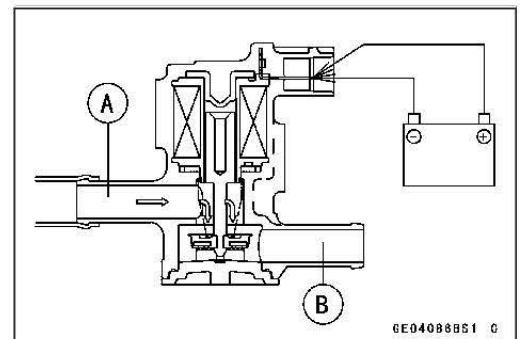
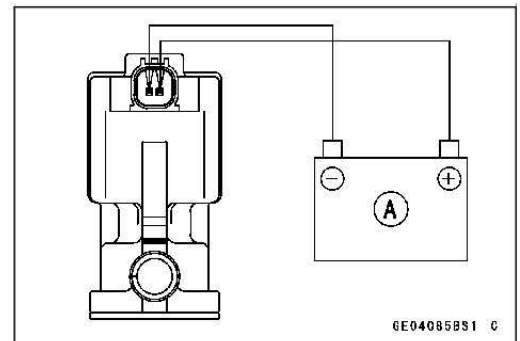
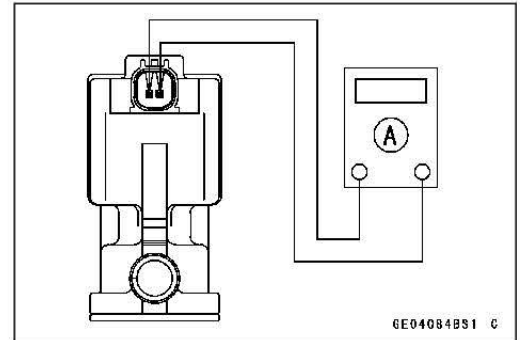
- Connect the 12 V battery [A] to the air switching valve terminals as shown.

- Blow the air to the inlet air duct [A], and make sure does not flow the blown air from the outlet air duct [B].

- Disconnect the 12 V battery.
- Blow the air to the inlet air duct [A] again, and make sure flow the blown air from the outlet air duct [B].
- ★ If the air switching valve does not operate as described, replace it with a new one.

NOTE

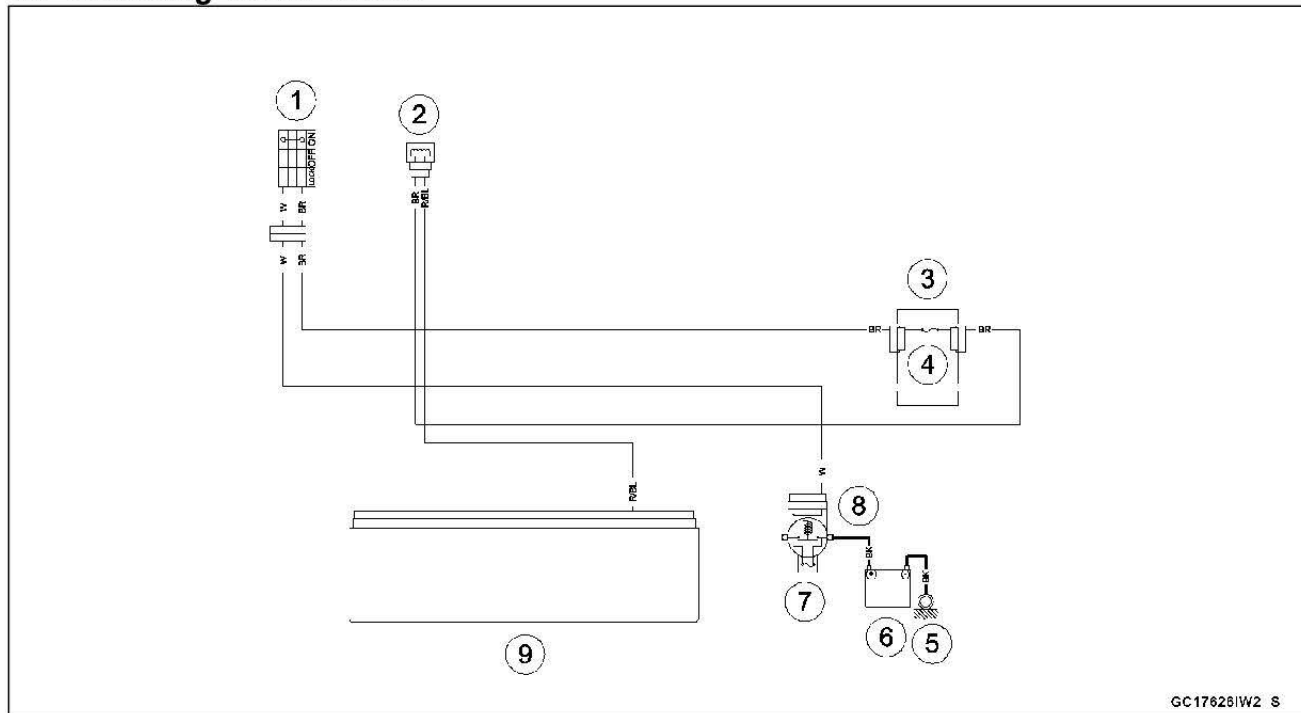
- To check air flow through the air switching valve, just blow through the air cleaner hose [C].



16-62 ELECTRICAL SYSTEM

Air Switching Valve

Air Switching Valve Circuit



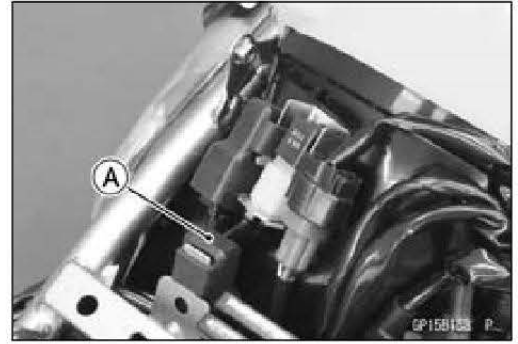
GC176261W2 S

1. Ignition Switch
2. Air Switching Valve
3. Fuse Box (2)
4. Ignition Fuse 10 A
5. Engine Ground
6. Battery
7. Main Fuse 20 A
8. Starter Relay
9. ECU

Radiator Fan System

Radiator Fan Relay Inspection

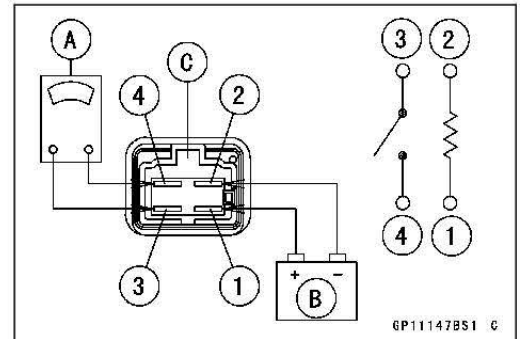
- Remove:
 - Seat (see [Seat Removal \(15-7\)](#))
 - Fan Relay [A]



- Connect a tester [A] and a 12 V battery [B] to the fan relay [C] as shown.
- ★ If the relay does not work as specified, the relay is defective. Replace the relay.

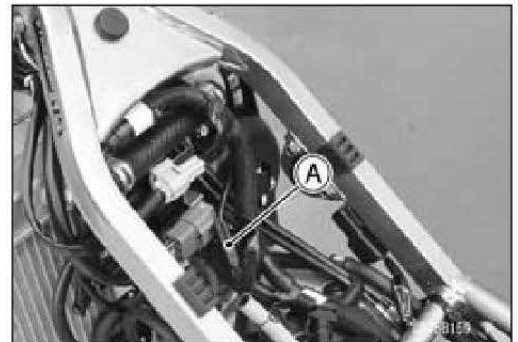
Testing Relay

Criteria: When battery is connected $\rightarrow 0 \Omega$
 When battery is disconnected $\rightarrow \infty \Omega$



Fan Motor Inspection

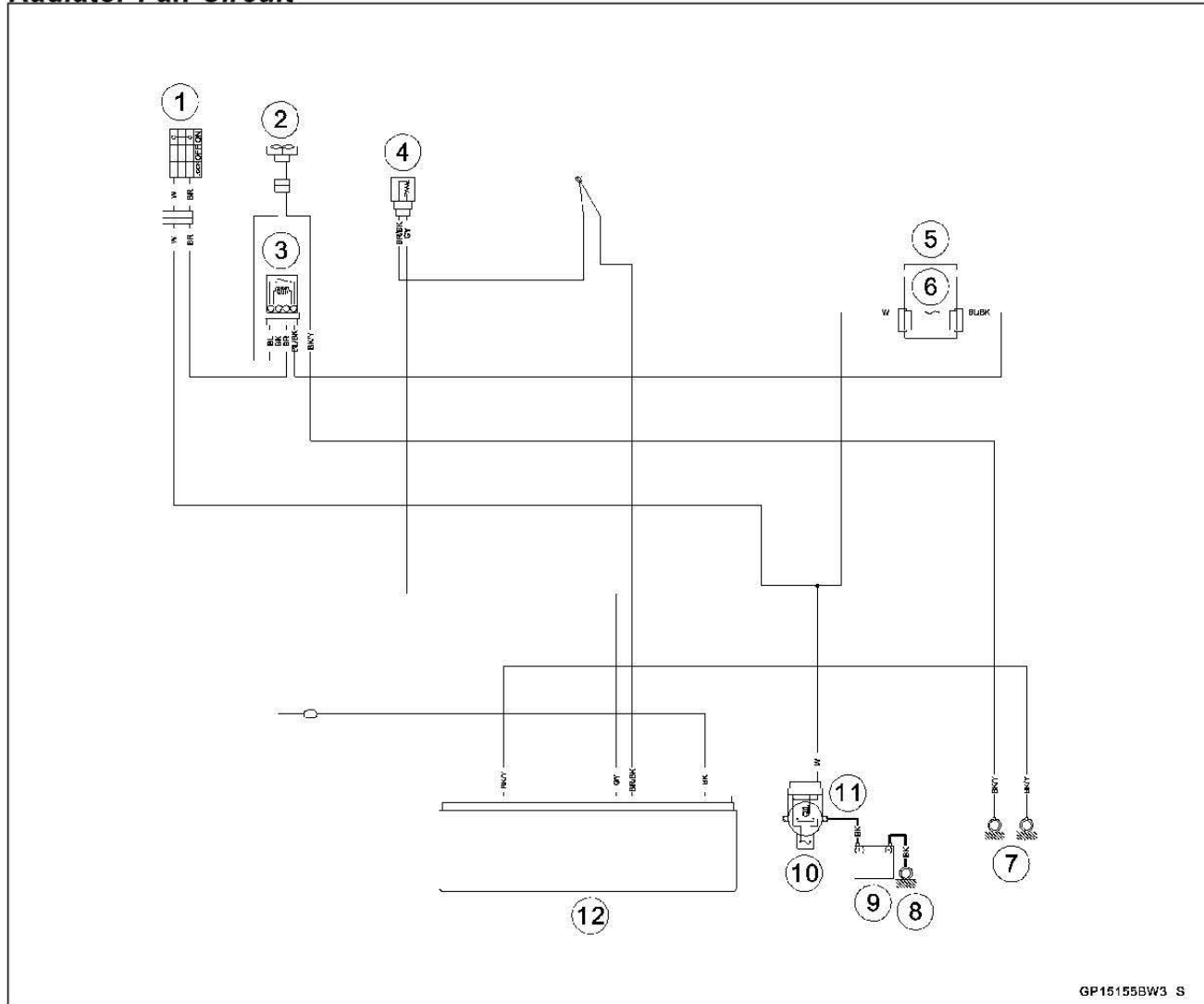
- Remove the fuel tank (see [Fuel Tank Removal\(3-113\)](#)).
- Disconnect the radiator fan lead connector [A].
- Using an auxiliary leads, supply battery power to the fan motor.
- ★ If the fan does not rotate, the fan motor is defective and must be replaced.



16-64 ELECTRICAL SYSTEM

Radiator Fan System

Radiator Fan Circuit



1. Ignition Switch
2. Fan Motor
3. Fan Relay
4. Water Temperature Sensor
5. Fuse Box (1)
6. Radiator Fan Fuse 10 A

7. Frame Grounds
8. Engine Ground
9. Battery
10. Main Fuse 20 A
11. Starter Relay
12. ECU

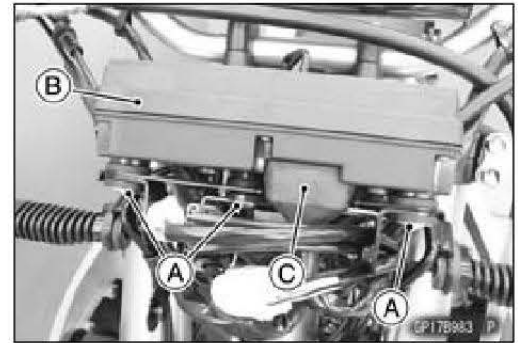
Meter, Gauge, Indicator Unit

Meter Unit Removal

- Remove:
 - Headlight/Meter Cover (see Headlight Removal(16-52))
 - Screws [A] and Washer
 - Meter Unit [B]
- Disconnect the meter connector [C].

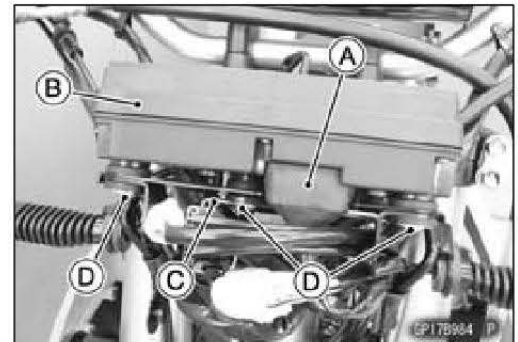
NOTICE

Do not drop the meter unit. Place the meter unit so that face is up. If a meter unit is left upside down or sideways for a long time or dropped, it will malfunction.



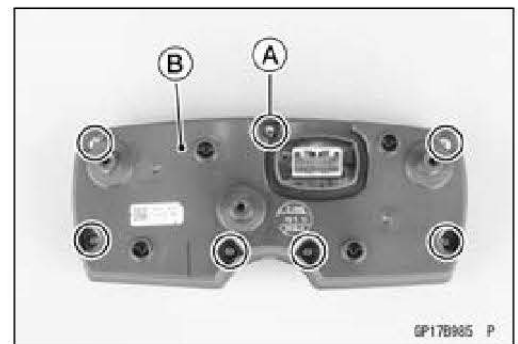
Meter Unit Installation

- Connect the meter connector [A].
- Install:
 - Meter Unit [B]
 - Bracket [C]
- Tighten the screws [D].

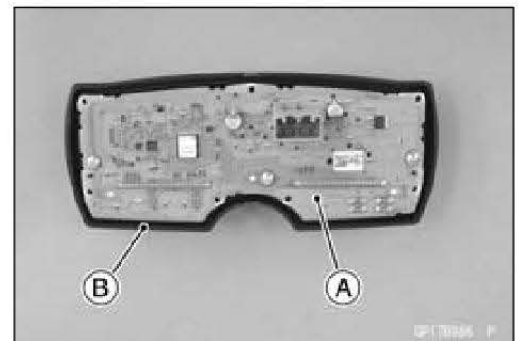


Meter Unit Disassembly

- Remove:
 - Meter Unit (see Meter Unit Removal(16-65))
 - Screws [A]
 - Lower Meter Cover [B]



- Separate the meter assembly [A] and upper meter cover [B].



16-66 ELECTRICAL SYSTEM

Meter, Gauge, Indicator Unit

Meter Unit Inspection

- Remove the meter unit [A] (see Meter Unit Removal(16-65)).

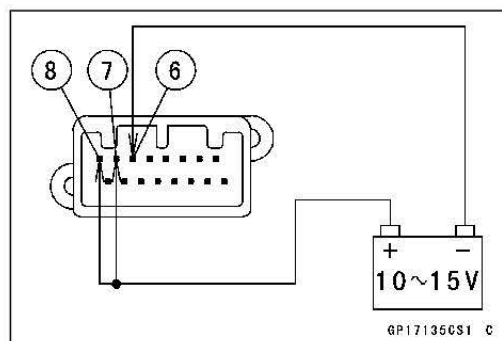
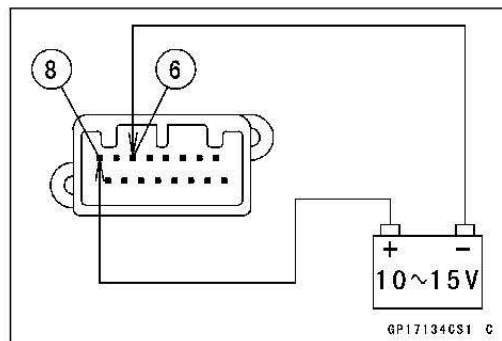
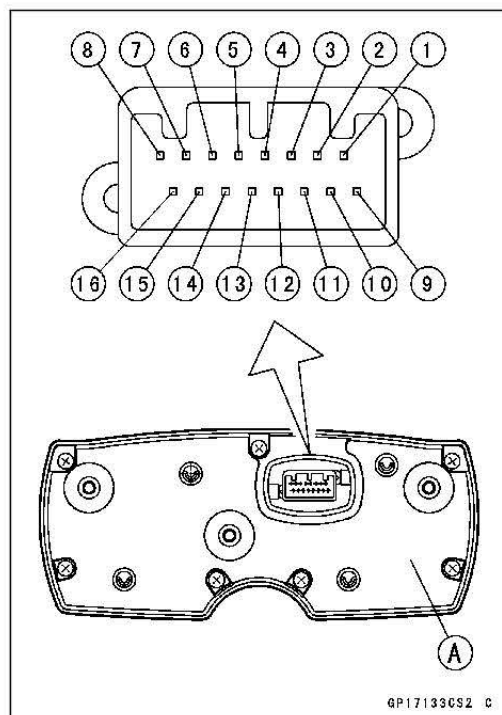
- [1] Tachometer Signal
- [2] Speed Sensor Signal
- [3] Unused
- [4] Unused
- [5] Speed Sensor Power Supply
- [6] Ground (-)
- [7] Ignition
- [8] Battery (+)
- [9] Green Neutral Indicator Light (LED) (-)
- [10] Blue High Beam Indicator Light (LED) (+)
- [11] Green Turn Signal Indicator Light (LED) (Right) (+)
- [12] Green Turn Signal Indicator Light (LED) (Left) (+)
- [13] Red Coolant Temperature Warning Indicator Light (LED) (-)
- [14] Yellow Engine Warning Indicator Light (LED) (-)
- [15] Unused
- [16] Amber Fuel Level Warning Indicator Light (LED) (-)

NOTICE

Do not drop the meter unit. Place the meter unit so that it faces upward. If the meter assembly is left upside down or sideways for a long time or dropped, it will malfunction. Do not short each terminals.

Liquid Crystal Display (LCD) Segments Check

- Using the insulated auxiliary leads, connect the 12 V battery to the meter unit connector as follows.
 - Connect the battery positive (+) terminal to the terminal [8].
 - Connect the battery negative (-) terminal to the terminal [6].
- Connect the terminal [7] to the battery (+) terminal.



Meter, Gauge, Indicator Unit

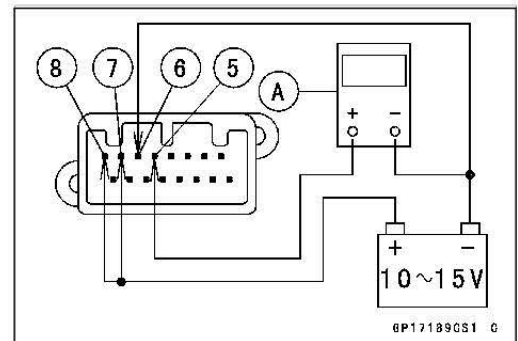
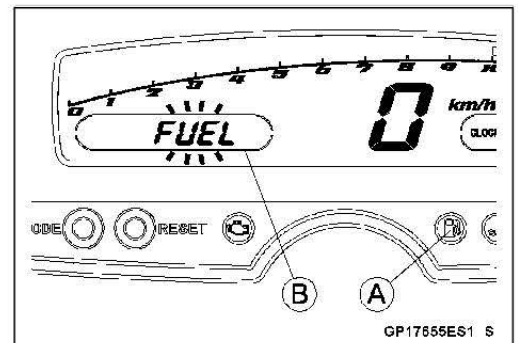
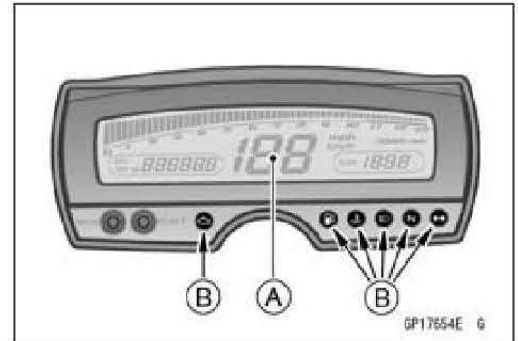
- When the terminals are connected, all the LCD segments [A] and all indicator lights (LED) [B] appear for three seconds.
- When the terminals are connected, tachometer momentarily goes from the minimum to the maximum, then goes back from the maximum to the minimum reading.
- ★ If the LCD segments will not appear, replace the meter assembly.
- Disconnect the terminal [7].
- All the LCD segments disappear.
- ★ If the segments do not disappear, replace the meter assembly.
- Connect the terminal [7] to the battery (+) terminal again.
- About 5 seconds after, the amber fuel level warning indicator light (LED) blinks [A] and the FUEL segments [B] appears in the display.
- The FUEL segments is flashing.
- ★ If the fuel level warning indicator light (LED) does not blink and/or the FUEL segments does not appear, replace the meter unit.

NOTE

- This meter unit has a failure detection function (for open or short) of the fuel reserve switch. When the fuel reserve switch is open or short, the meter unit alerts the rider by the fuel level warning indicator light (LED) blinks and the FUEL segments appears in the display.
- If the failure detection function operates with the meter unit installed on the motorcycle, inspect the fuel reserve switch (see *Fuel Reserve Switch Inspection(16-77)*) and wiring.

Speed Sensor Power Supply Inspection

- Using the insulated auxiliary leads, connect the 12 V battery to the meter unit connector as follows.
- Connect the battery positive terminal to the terminal [8].
- Connect the battery negative terminal to the terminal [6].
- Connect a digital meter [A] to the terminal [5] and [6].
- ★ If the voltage is not battery voltage, replace the meter assembly.



16-68 ELECTRICAL SYSTEM

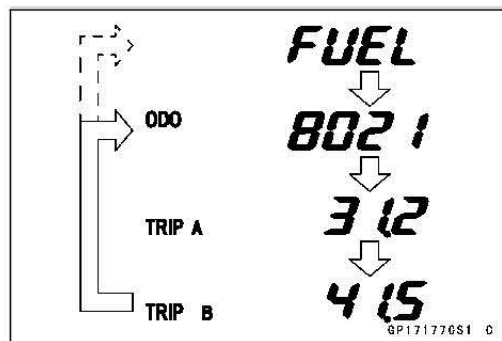
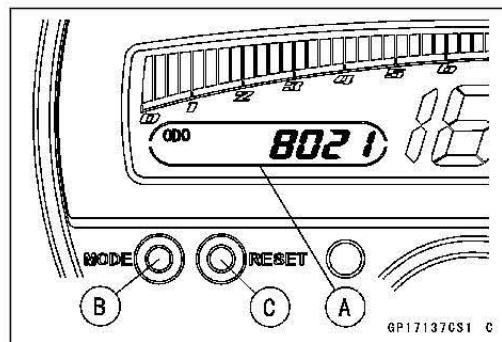
Meter, Gauge, Indicator Unit

MODE and RESET button Operation Check

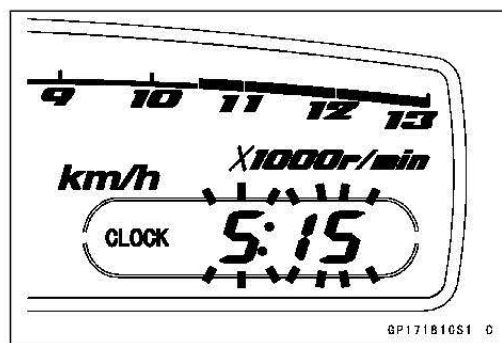
- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments Check".
- Check that the display [A] change to the ODO, TRIP A and TRIP B displays each time the MODE button [B] is pressed.
- ★ If the display function does not work, replace the meter assembly.

RESET button [C]

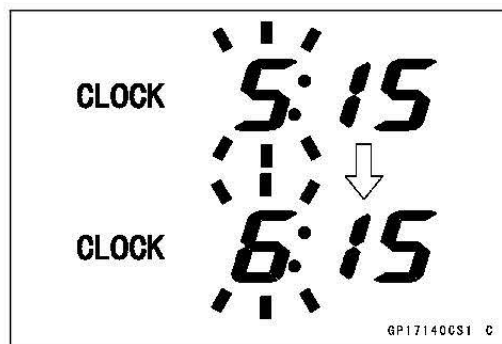
- When fuel level warning indicator light (LED) blinks, the display changes in order of FUEL, ODO, TRIP A and TRIP B.



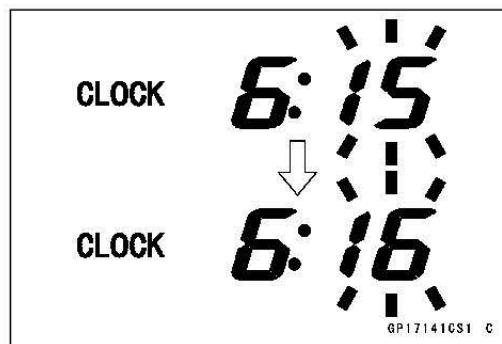
- Set the ODO mode by pushing the MODE button.
- Push the RESET button for more than two seconds.
- The clock setting menu (hour and minute) should blink.



- In the clock setting mode, press the reset button again to effect the HOUR setting mode.
- The hour display blinks on the display.
- Press the MODE button to set the hour.

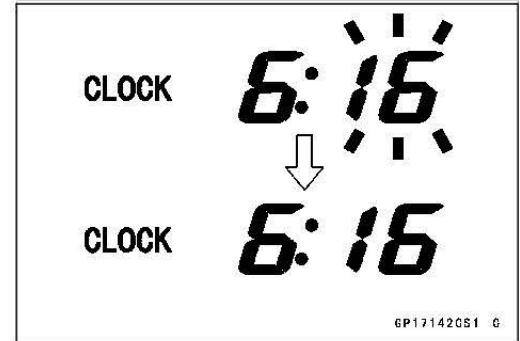


- In the HOUR setting mode, press the RESET button to effect the MINUTE setting mode.
- The minute display blinks on the display.
- Press the MODE button to set the minute.



Meter, Gauge, Indicator Unit

- In the MINUTE setting mode, press the RESET button to return to the clock setting mode.
- Press the MODE button to complete the time setting process.
- The clock starts counting the seconds as soon as the MODE button is pressed.

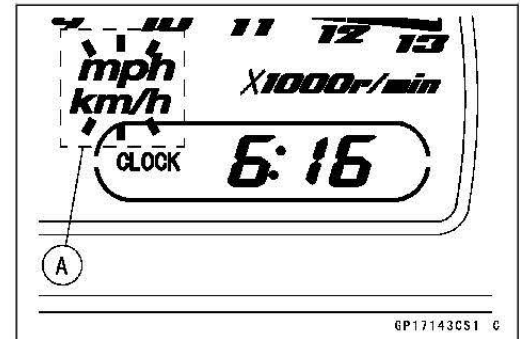


- Set the ODO mode by pushing the MODE button.
- Check that the display [A] change to the mile and km display each time by pushing the RESET button while MODE button pushed in.

NOTE

○ Mile/Km Display can alternate between English and metric modes (mile and km) in the digital meter. Make sure that km or mile according to local regulations is correctly displayed before riding.

- ★ If the display function does not work and adjust, replace the meter assembly.

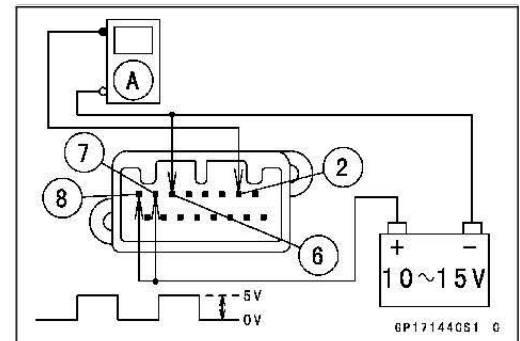


Speedometer Check

- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments Check".
- The speed equivalent to the input frequency is indicated in the oscillator [A], if the square wave (illustrated as shown) would be input into the terminal [2].

KLX300D Model

- Indicates approximately 60 km/h in case the input frequency would be approximately 62.4 Hz.
- Indicates approximately 60 mph in case the input frequency would be approximately 99.8 Hz.



KLX300E Model

- Indicates approximately 60km/h in case the input frequency would be approximately 74.0 Hz.
- Indicates approximately 60mph in case the input frequency would be approximately 118.4 Hz.
- If the oscillator is not available, the speedometer can be checked as follows.
 - Install the meter unit.
 - Raise the rear wheel off the ground, using the jack.
 - Turn on the ignition switch.
 - Rotate the front wheel by hand.
 - Check that the speedometer shows the speed.
- ★ If the speedometer does not work, check the speed sensor and wiring (see Speed Sensor Input Voltage Inspection(3-59)).
- ★ If the speed sensor and wiring are normal, replace the meter assembly.

16-70 ELECTRICAL SYSTEM

Meter, Gauge, Indicator Unit

Odometer Check

- Check the odometer with the speedometer check in the same way.
- ★ If value indicated in the odometer is not added, replace the meter assembly.

NOTE

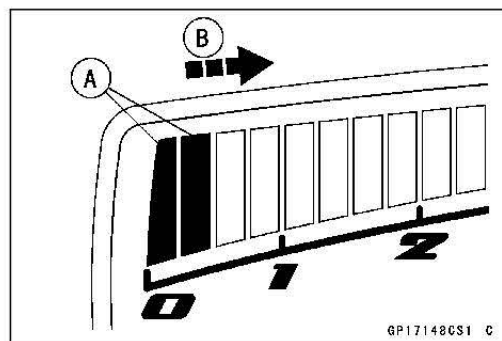
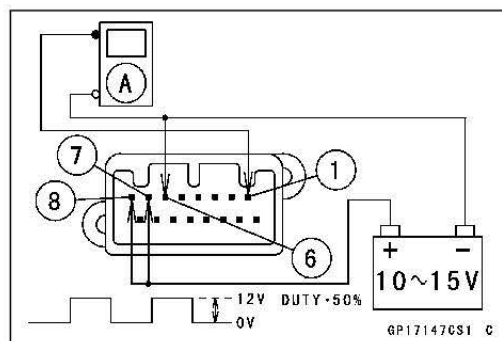
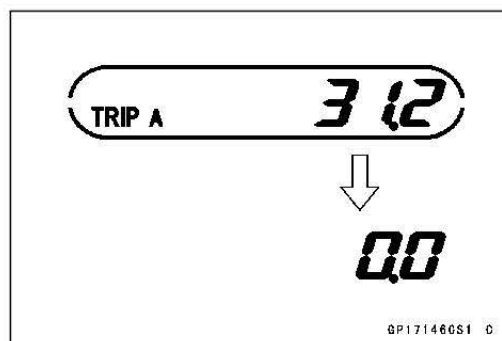
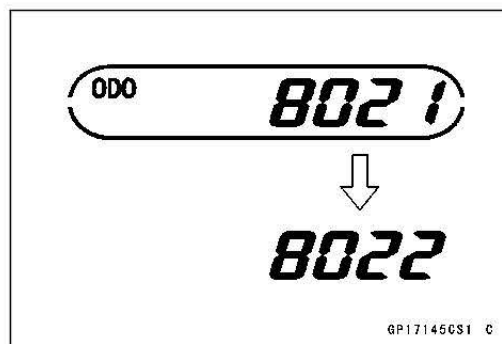
- The data is maintained even if the battery is disconnected.
- When the figures come to 999999, they are stopped and locked.

Trip Meter Check

- Check the trip meter with the speedometer check in the same way.
- ★ If value indicated in the trip meter is not added, replace the meter assembly.
- Check that when the RESET button is pushed for more than two seconds, the figure display turns to 0.0.
- ★ If the figure display does not indicate 0.0, replace the meter assembly.

Tachometer Check

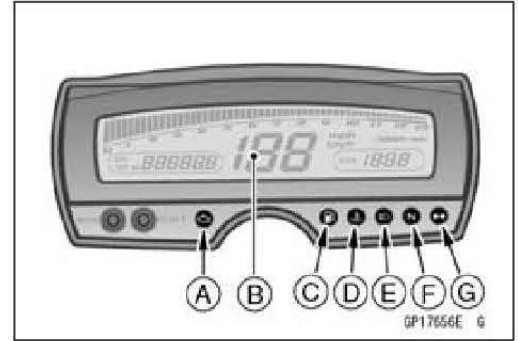
- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments Check".
- When the terminals are connected, the tachometer momentary goes from the minimum to the maximum, then goes back from the maximum to the minimum reading.
- ★ If the tachometer segments function does not work, replace the meter assembly.
- The revolutions per minute (rpm) equivalent to the input frequency is indicated in the oscillator [A] if the square wave (illustrated as shown) would be input into the terminal [1].
- Indicates approximately 4 000 rpm in case the input frequency would be approximately 33.3 Hz.
- If the oscillator is not available, the tachometer can be checked as follows.
- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments Check".
- When the terminals are connected, the tachometer momentary goes from minimum to the maximum, then goes back from the maximum to the minimum reading.
- ★ If the tachometer segments function does not work, replace the meter assembly.
- Using the insulated auxiliary lead, quickly open and connect the terminal [7] to the terminal [1] repeatedly.
- Then the tachometer segments [A] should flick [B].
- ★ If the hand does not flick, replace the meter assembly.



Meter, Gauge, Indicator Unit

Lights (LED) Inspection

- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments check".
- Yellow Engine Warning Indicator Light (LED) [A]
- Illumination Light (LED) [B]
- Amber Fuel Level Warning Indicator Light (LED) [C]
- Red Coolant Temperature Warning Indicator Light (LED) [D]
- Blue High Beam Indicator Light (LED) [E]
- Green Neutral Indicator Light (LED) [F]
- Green Turn Signal Indicator Light (LED) [G]

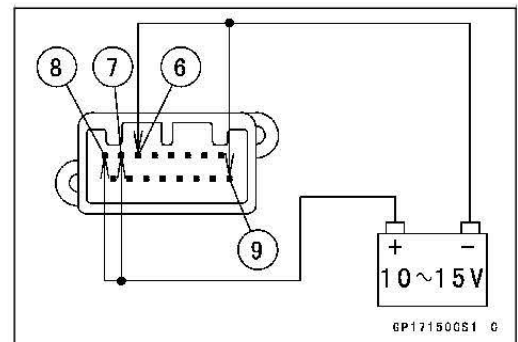


Illumination Light (LED) Inspection

- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments check".
- When the terminals are connected, the illumination light (LED) should go on.
- ★ If the illumination light (LED) does not go on, replace the meter assembly.

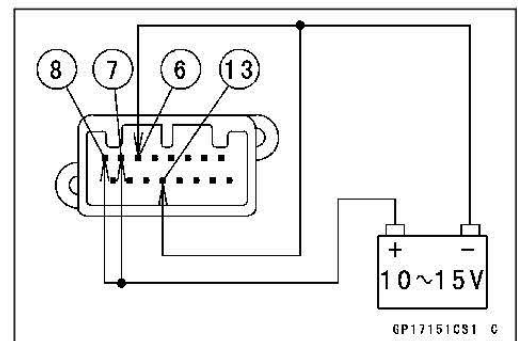
Green Neutral Indicator Light (LED) Inspection

- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments check".
- Using the insulated auxiliary lead, 12 V battery to the meter unit connector as follows.
- Connect the battery negative (–) terminal to the terminal [9].
- When the terminals are connected, the neutral indicator light (LED) should go on.
- ★ If the green neutral indicator light (LED) does not go on, replace the meter assembly.



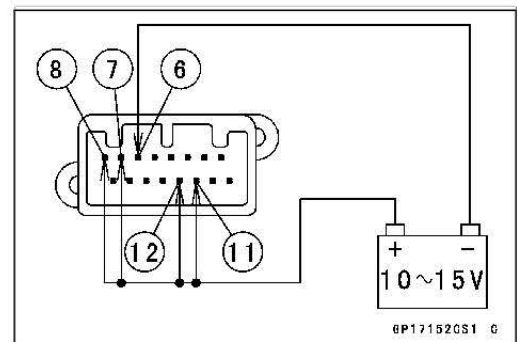
Red Coolant Temperature Warning Indicator Light (LED)

- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments check".
- Using the insulated auxiliary lead, 12 V battery to the meter unit connector as follows.
- Connect the battery negative (–) terminal to the terminal [13].
- ★ If the red coolant temperature warning indicator light (LED) does not go on, replace the meter assembly.



Green Turn Signal Indicator Light (LED)

- Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments check".
- Using the insulated auxiliary leads, 12 V battery to the meter unit connector as follows.
- Connect the battery positive (+) terminal to the terminal [11].
- Connect the battery positive (+) terminal to the terminal [12].



16-72 ELECTRICAL SYSTEM

Meter, Gauge, Indicator Unit

○When the terminals are connected, the turn signal indicator light (LED) should go on.

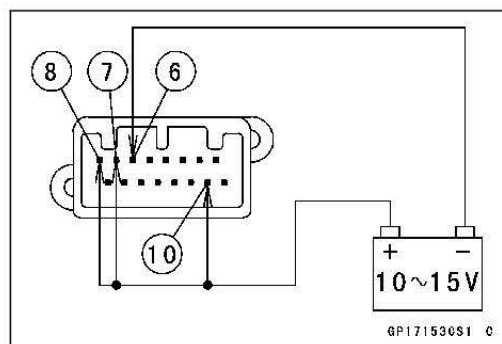
★If the turn green signal indicator light (LED) does not go on, replace the meter assembly.

Blue High Beam Indicator Light (LED)

○Connect the 12 V battery and terminals in the same manner as specified in the "Liquid Crystal Display (LCD) Segments check".

● Using the insulated auxiliary lead, 12 V battery to the meter unit connector as follows.

○Connect the battery positive (+) terminal to the terminal [10].



○When the terminals are connected, the high beam indicator light (LED) should go on.

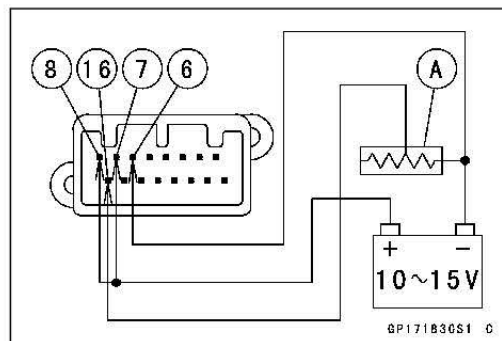
★If the blue high beam indicator light (LED) does not go on, replace the meter assembly.

Amber Fuel Level Warning Indication Light (LED)

○Connect the 12 V battery and terminals in the same Manner as specified in the "Liquid Crystal Display (LCD) Segments check".

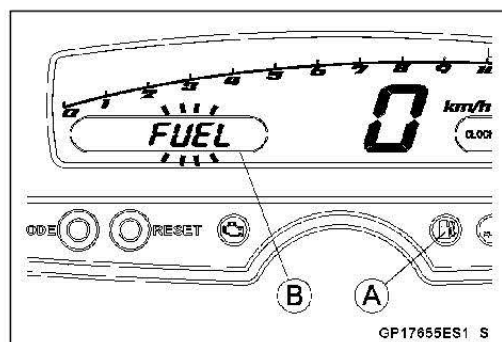
● Connect the variable rheostat [A] to the terminal [16] as shown.

● Adjust the resistance value to the approximately 20 Ω .



○When the terminals are connected, the fuel level warning indicator light (LED) [A] should go on and FUEL segment [B] blinks in the display.

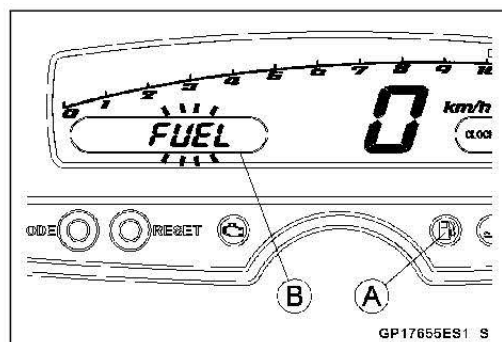
★If the amber fuel level warning indicator light (LED) does not go on or FUEL segment do not appear, replace the meter assembly.



● Disconnect the terminal [16].

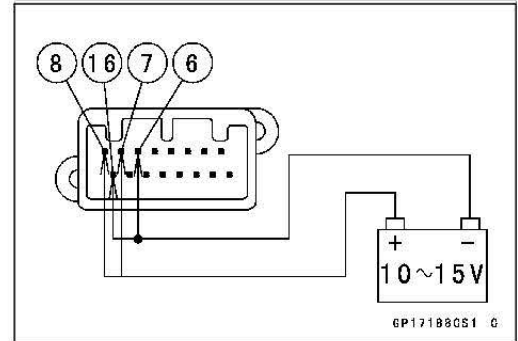
○When the terminals are disconnected, the amber fuel level warning indicator light (LED) [A] blinks and FUEL segment [B] blinks by display.

★If the amber fuel level warning indicator light (LED) does not blink or FUEL segment do not display, replace the meter unit.



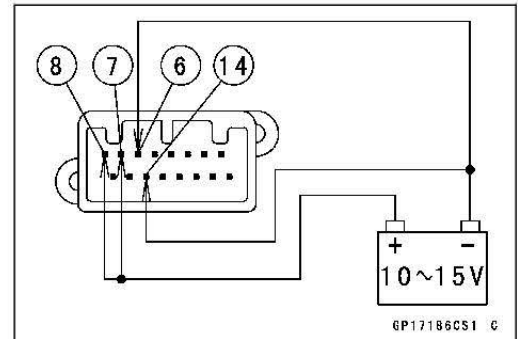
Meter, Gauge, Indicator Unit

- Connect the battery negative (–) terminal to the terminal [16].
- When the terminals are connected, the amber fuel level warning indicator light (LED) blinks and FUEL segment blinks by display.
- ★ If the fuel level warning indicator light (LED) does not blink or FUEL segment do not display, replace the meter unit.

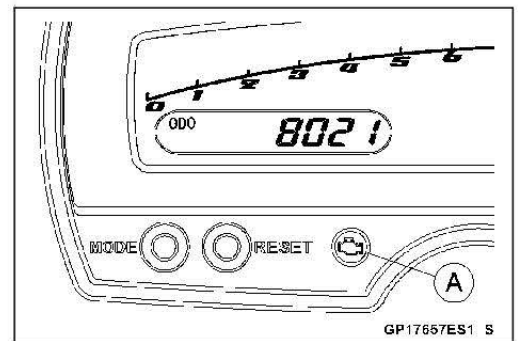


Yellow Engine Warning Indicator Light (LED)

- Connect the 12 V battery and terminals in the same Manner as specified in the “Liquid Crystal Display (LCD) Segments check”.
- Using the insulated auxiliary lead, 12 V battery to the meter unit connector as follows.
- Connect the battery negative (–) terminal to the terminal [14].



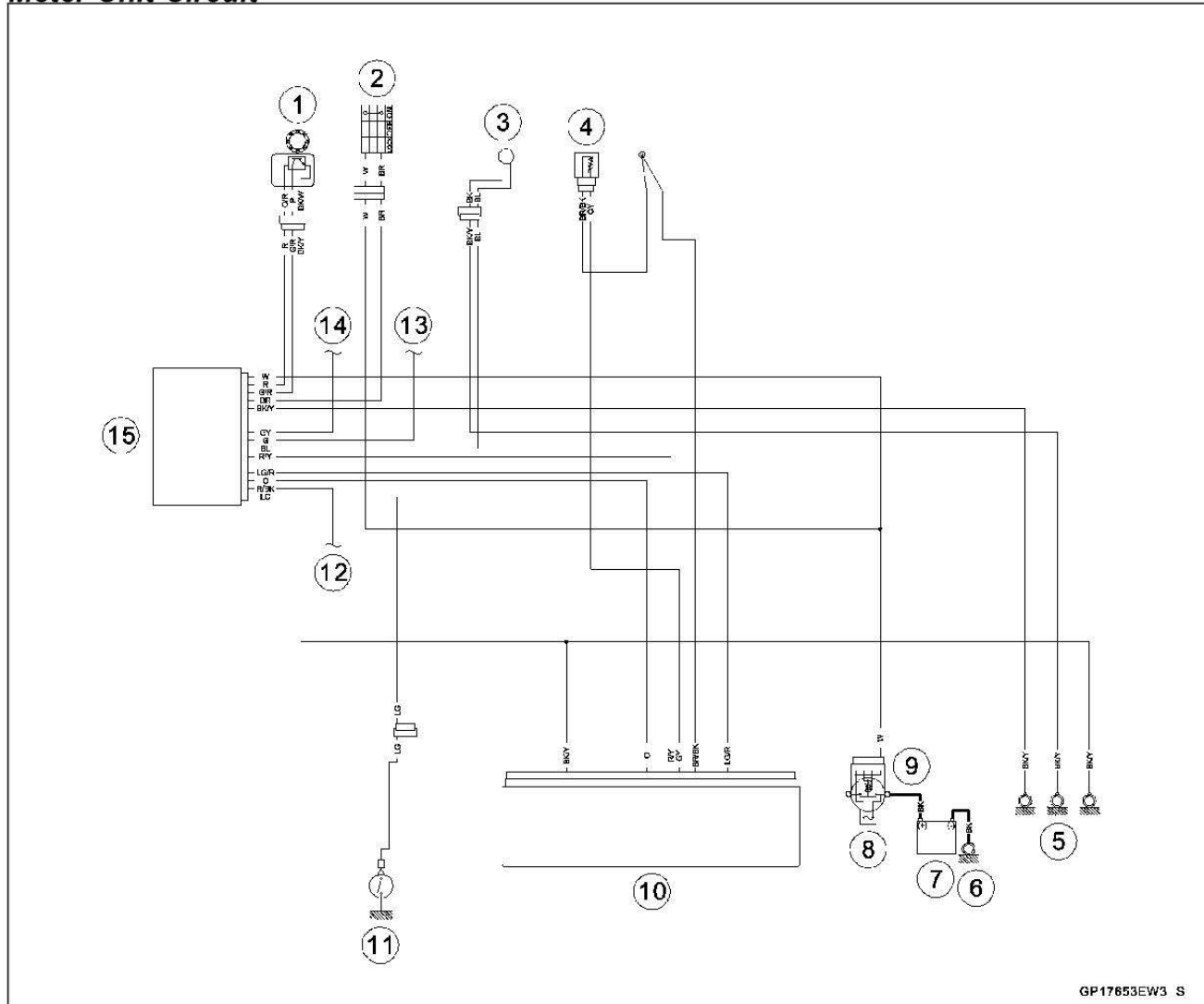
- When the terminals are connected, the yellow engine warning indicator light (LED) [A] should go on.
- ★ If the yellow engine warning indicator light (LED) does not go on, replace the meter unit.



16-74 ELECTRICAL SYSTEM

Meter, Gauge, Indicator Unit

Meter Unit Circuit



- | | |
|-----------------------------|-----------------------------------|
| 1. Speed Sensor | 9. Starter Relay |
| 2. Ignition Switch | 10. ECU |
| 3. Fuel Reserve Switch | 11. Neutral Switch |
| 4. Water Temperature Sensor | 12. To Dimmer Switch (High Beam) |
| 5. Frame Grounds | 13. To Turn Signal Switch (Left) |
| 6. Engine Ground | 14. To Turn Signal Switch (Right) |
| 7. Battery | 15. Meter Unit |
| 8. Main Fuse 20 A | |

Switches and Sensors

Water Temperature Sensor Inspection

- Remove the water temperature sensor (see [Water Temperature Sensor Removal\(3-55\)](#)).
- Suspend the sensor [A] in a container of machine oil so that the heat-sensitive portion and threaded portion are submerged.
- Suspend an accurate thermometer [B] with heat-sensitive portions [C] located in almost the same depth.

NOTE

○ The sensor and thermometer must not touch the container side or bottom.

- Place the container over a source of heat and gradually raise the temperature of the oil while stirring the oil gently for even temperature.
- Using a digital meter, measure the internal resistance of the sensor.
- ★ If the measurement is out of the range, replace the sensor.

Water Temperature Sensor Resistance

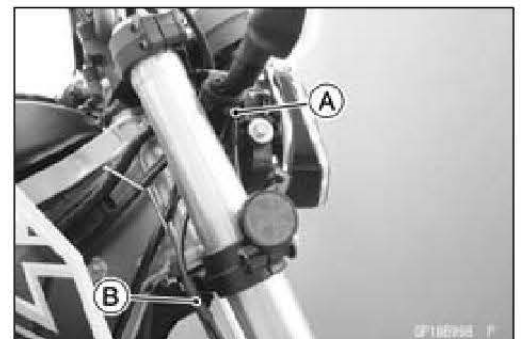
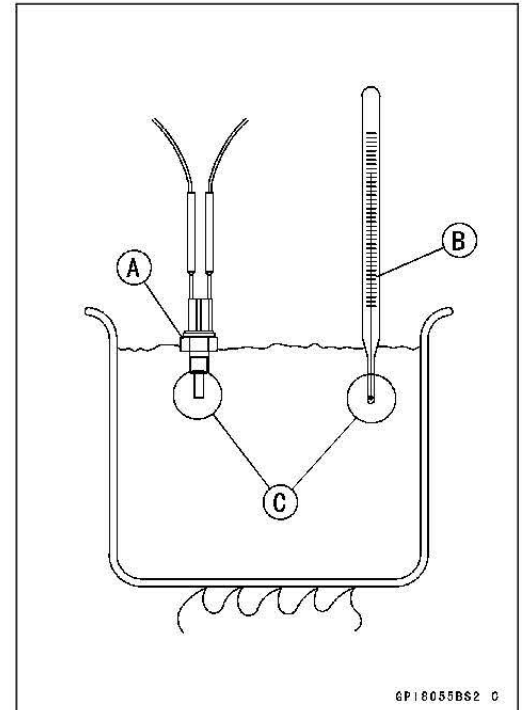
Temperature	Resistance (kΩ)
-20°C (-4°F)	*18.80 ±2.37
0°C (32°F)	*(About 6.544)
40°C (104°F)	1.136 ±0.095
100°C (212°F)	0.1553 ±0.0070

*: Reference Information

Speed Sensor Removal

- Remove:
Headlight (see [Headlight Removal\(16-52\)](#))
- Disconnect the speed sensor connector [A].

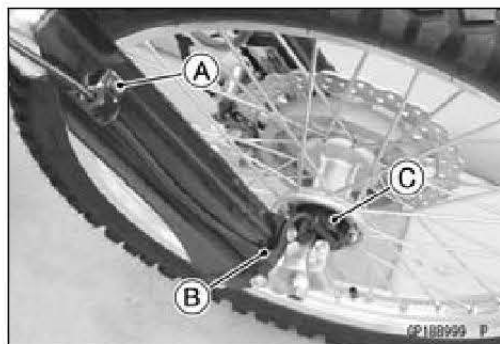
- Remove:
Clamp [A]
- Open the band [B].



16-76 ELECTRICAL SYSTEM

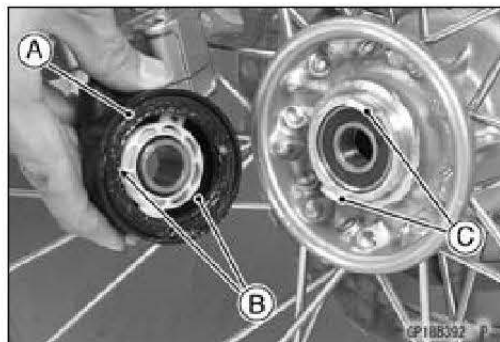
Switches and Sensors

- Remove:
 - Bolt [A]
- Open the band [B].
- Remove:
 - Front Wheel (see [Front Wheel Removal\(10-7\)](#))
 - Speed Sensor [C]



Speed Sensor Installation

- Apply grease to the speed sensor seal lip [A].
 - Install the speed sensor so that grooves [B] of the speed sensor fit the projections [C] of the front hub.
- After installing it, lightly turn the speed sensor housing left and right by half a turn to check if the projection of hub are engaged properly in the grooves provided on the speed sensor.

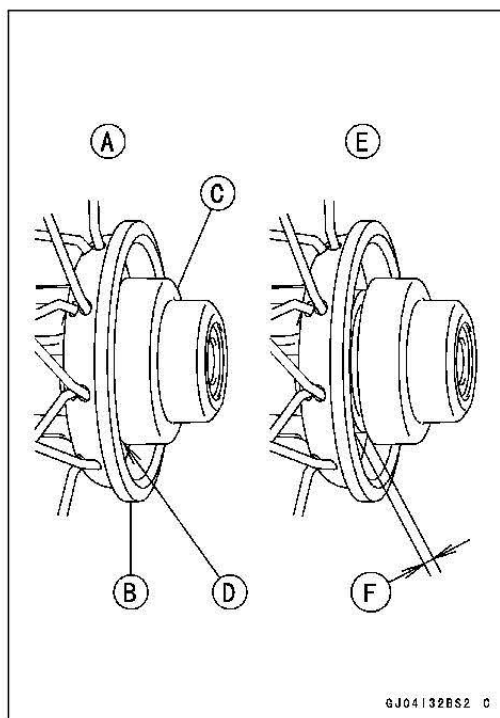


- When they are installed properly [A], no gaps [D] should be observed between the wheel [B] and the housing [C]. If there is a gap [F] between the wheel and the housing, then they are not engaged properly [E].

NOTICE

Unless the speed sensor housing is properly installed on the wheel, you will damage the speed sensor rotor in tightening the front axle.

- Install the front wheel (see [Front Wheel Installation\(10-7\)](#)).



Speed Sensor Inspection

- Refer to the Speed Sensor Input Voltage Inspection (see [Speed Sensor Input Voltage Inspection\(3-59\)](#)).

Switches and Sensors

Fuel Reserve Switch Inspection

- Fill the fuel tank with fuel.
- Close the fuel tank cap surely.
- Remove:
Right Side Cover (see Side Cover Removal(15-8))
- Disconnect:
Fuel Pump Lead Connector [A]



- Connect the test light [A] (12 V 3.4 W bulb in a socket with leads) and the 12 V battery [B] to the fuel pump lead connector [C].

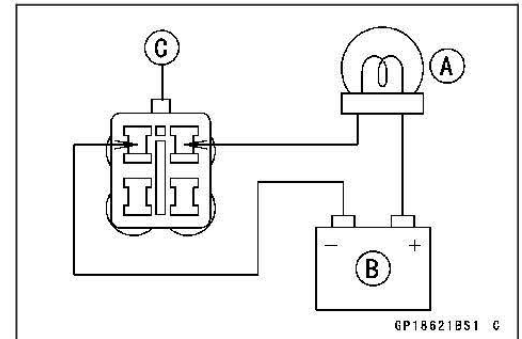
Connections:

Battery (+) → 12 V 3.4 W Bulb (one side)

12 V 3.4 W Bulb (other side) → BL Lead Terminal

Battery (–) → BK Lead Terminal

- ★ If the test light goes on, the reserve switch is defective. Replace the fuel pump.



- Draw the fuel out from the fuel tank with a commercially available pump (see Fuel Pump Removal(3-101)).
- Connect the test light (12 V 3.4 W bulb in a socket with leads) and the 12 V battery to the fuel pump lead connector same way again.

Connections:

Battery (+) → 12 V 3.4 W Bulb (one side)

12 V 3.4 W Bulb (other side) → BL Lead Terminal

Battery (–) → BK Lead Terminal

- ★ If the test light does not light, replace the fuel pump.

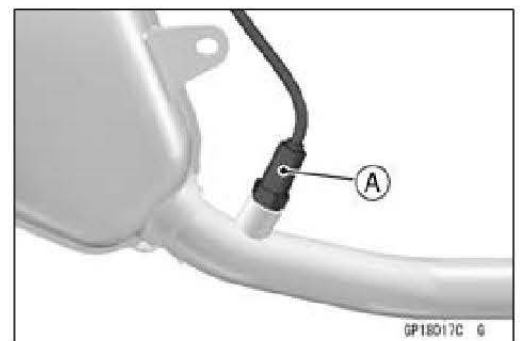
NOTE

○ It may take a long time to go on the test light in case that the fuel reserve switch is inspected just after the fuel is drawn.

Leave the fuel pump lead connector with leads for inspection connected for few minutes.

Oxygen Sensor Removal

- Remove:
Muffler Body (see Muffler Body Removal(5-43))
Oxygen Sensor [A]



16-78 ELECTRICAL SYSTEM

Switches and Sensors

Oxygen Sensor Installation

NOTICE

Never drop the Oxygen Sensor [A] especially on a hard surface. Such a shock to the unit can damage it.

Do not touch the sensing part [B] to prevent oil contact. Oil contamination from hands can reduce sensor performance.

- Tighten:
Torque - Oxygen Sensor: 25 N·m (2.5 kgf·m, 18 ft·lb)
- Install the removed parts.

Oxygen Sensor Inspection

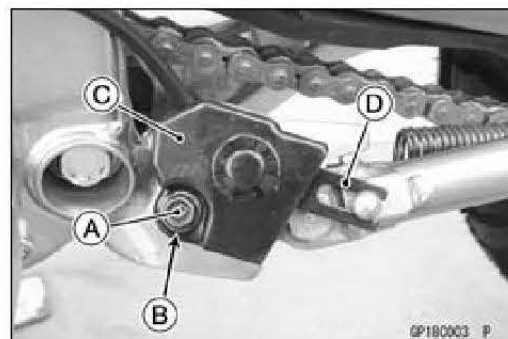
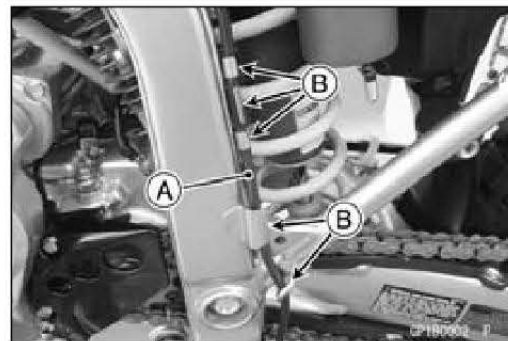
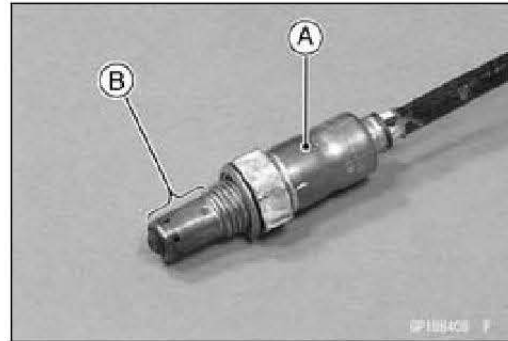
- Refer to the Oxygen Sensor Inspection (see Oxygen Sensor Inspection(3-71)).

Oxygen Sensor Heater Inspection

- Refer to the Oxygen Sensor Heater Resistance Inspection (see Oxygen Sensor Heater Resistance Inspection(3-90)).

Side Stand Switch Removal

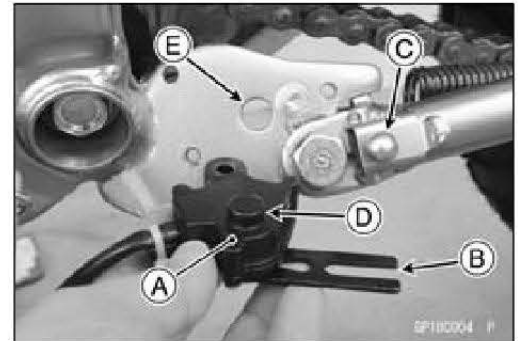
- Disconnect:
Side Stand Switch Lead Connector [A]
- Free the side stand switch lead [A] from the guides [B].
- Remove:
Bolt [A]
Collar [B]
Side Stand Switch Cover [C]
Side Stand Switch [D]



Switches and Sensors

Side Stand Switch Installation

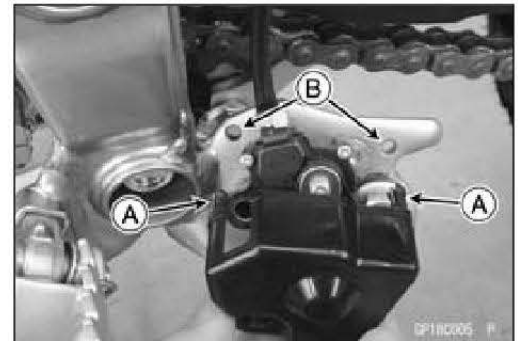
- Install the side stand switch [A] as follows.
- Fit the slit [B] to the projection [C].
- Insert the projection [D] into the hole [E].



- Insert the projections [A] of the side stand switch cover into the holes [B].
- Apply a non-permanent locking agent to the side stand switch bolts, and tighten it.

Torque - Side Stand Switch Bolt: 8.8 N·m (0.90 kgf·m, 78 in·lb)

- Run the side stand switch lead to correctly (see Cable, Wire, and Hose Routing section (17-2)).
- Connect the side stand switch lead connector.



Brake Light Timing Inspection

- Refer to the Brake Light Switch Operation Inspection (see Brake Light Switch Operation Inspection(2-51)).

Brake Light Timing Adjustment

- Refer to the Brake Light Switch Operation Inspection (see Brake Light Switch Operation Inspection(2-51)).

Switch Inspection

- Using a tester, check to see that only the connections shown in the table have continuity.
- For the switch housings and the ignition switch, refer to the tables in the Wiring Diagram.
- ★ If the switch has an open or short, repair it or replace it with a new one.

Rear Brake Light Switch Connections

Rear Brake Light Switch Connections		
Color	BR	BK
When brake pedal is pushed down	○	○
When brake pedal is released		

Side Stand Switch Connections

Side Stand Switch Connections		
Color	BK	G
When side stand is down		
When side stand is up	○	○

Neutral Switch Connections

Neutral Switch Connections		
Color	SW.Terminal	Ground
When transmission is in neutral	○	○
When transmission is not in neutral		

16-80 ELECTRICAL SYSTEM

Fuse

20 A Main Fuse Removal

- Remove the seat (see [Seat Removal \(15-7\)](#)).
- Disconnect the starter relay connector [A].

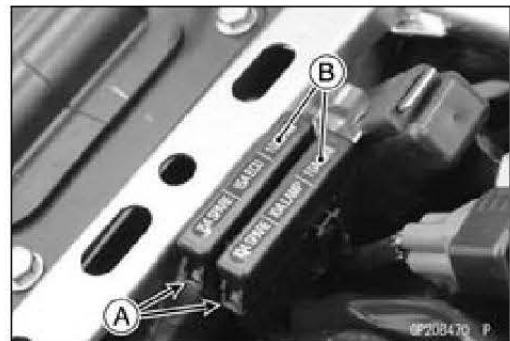


- Pull out the main fuse [A] from the starter relay with needle nose pliers.

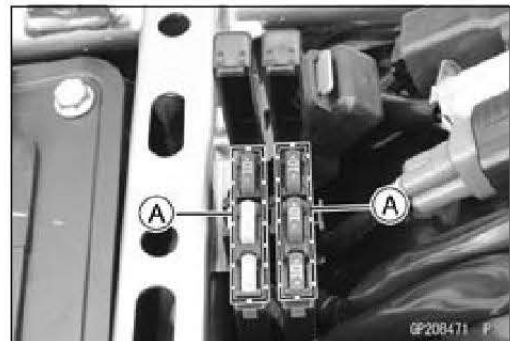


Fuse Box Fuse Removal

- Remove the seat (see [Seat Removal \(15-7\)](#)).
- Unlock the hooks [A] to lift up the lids [B].



- Pull the fuses [A] straight out of the fuse box with needle nose pliers.



Fuse Installation

- If a fuse fails during operation, inspect the electrical system to determine the cause, and then replace it with a new fuse of proper amperage.
- Install the fuse box fuses on the original position as specified on the lid.

Fuse

Fuse Inspection

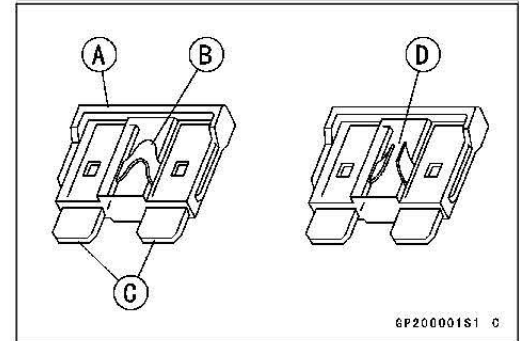
- Remove the fuse (see 20 A Main Fuse Removal(16-80)) (see Fuse Box Fuse Removal(16-80)).
- Inspect the fuse element.
- ★ If it is blown out, replace the fuse. Before replacing a blown fuse, always check the amperage in the affected circuit. If the amperage is equal to or greater than the fuse rating, check the wiring and related components for a short circuit.

Housing [A]

Fuse Element [B]

Terminals [C]

Blown Element [D]



NOTICE

When replacing a fuse, be sure the new fuse matches the specified fuse rating for that circuit. Installation of a fuse with a higher rating may cause damage to wiring and components.

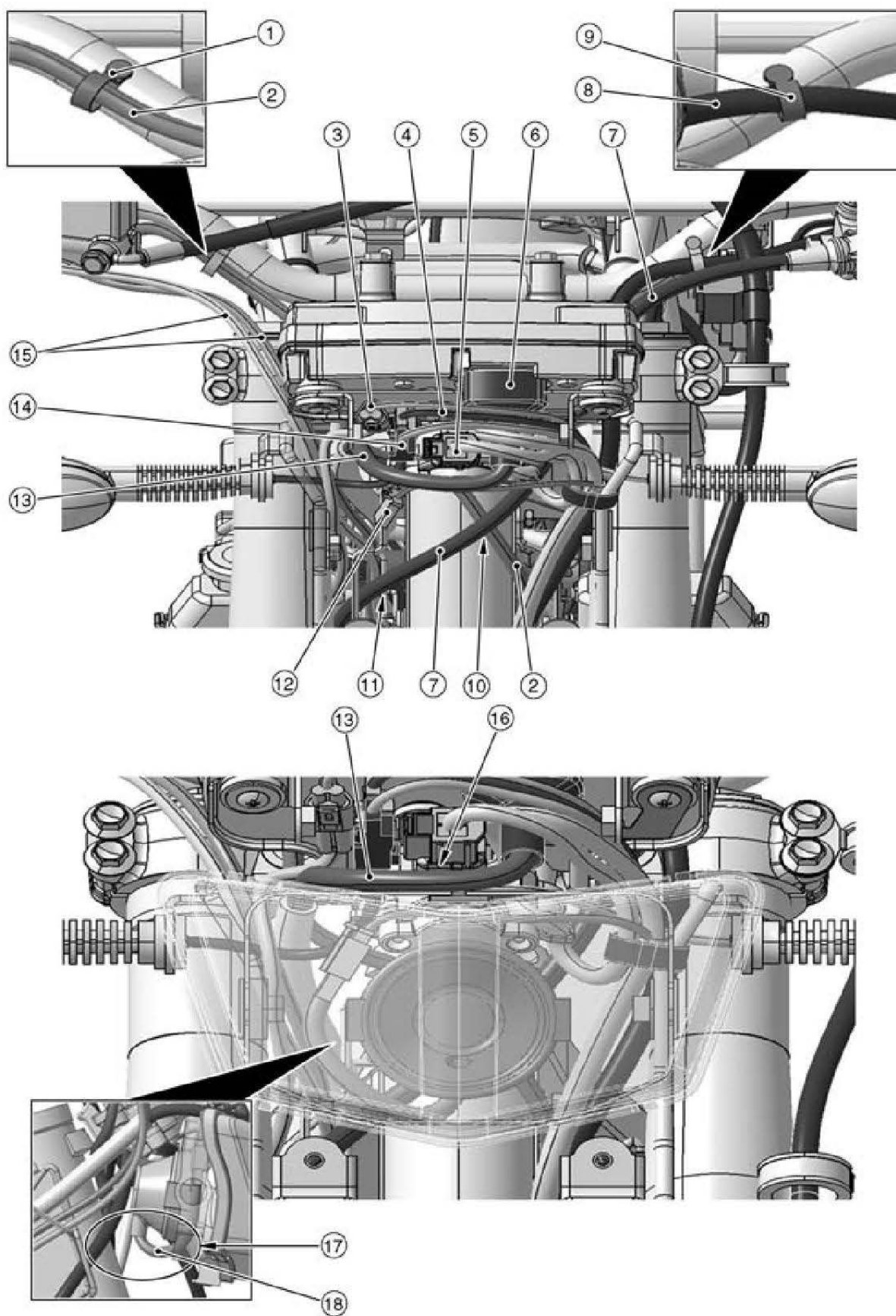
Appendix

Table of Contents

Cable, Wire, and Hose Routing	17-2
Troubleshooting Guide	17-50

17-2 APPENDIX

Cable, Wire, and Hose Routing

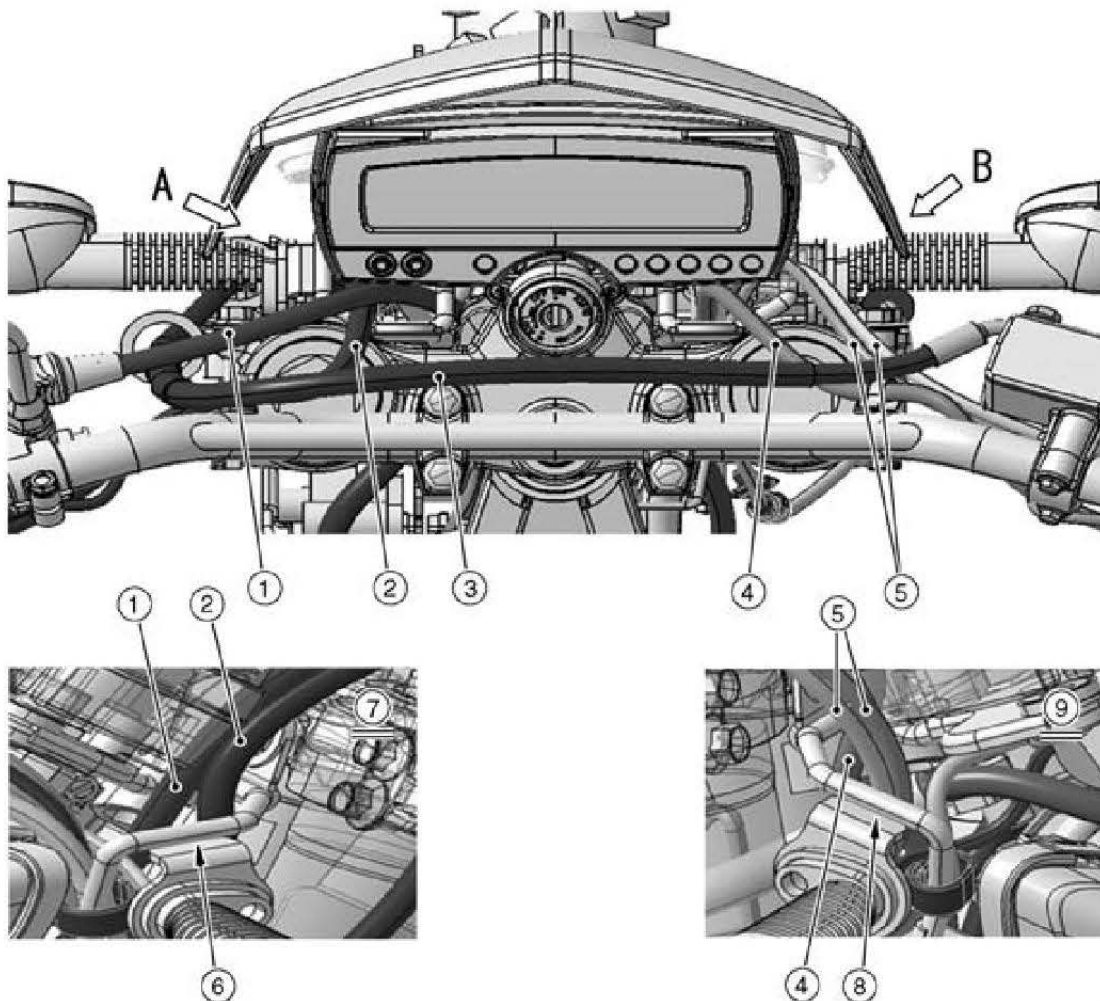


Cable, Wire, and Hose Routing

1. Clamp (Hold the right switch housing lead, and install it to the handlebars.)
2. Right Switch Housing Lead
3. Front Wheel Rotation Sensor Lead
4. Front Right Turn Signal Light Lead
5. Ignition Switch Lead
6. Meter Lead Connector
7. Clutch Cable
8. Left Switch Housing Lead
9. Clamp (Hold the left switch housing lead, and install it to the handlebars.)
10. Run the right switch housing lead to the front side of the head pipe, and run it to the rear side of the clutch cable.
11. Run the clutch cable to the front side of the head pipe.
12. Headlight Lead Connector
13. Meter Lead
14. Front Left Turn Signal Light Lead
15. Throttle Cables
16. Run the meter lead to the upside of the headlight.
17. Do not touch the headlight lead with the head pipe.
18. Headlight Lead

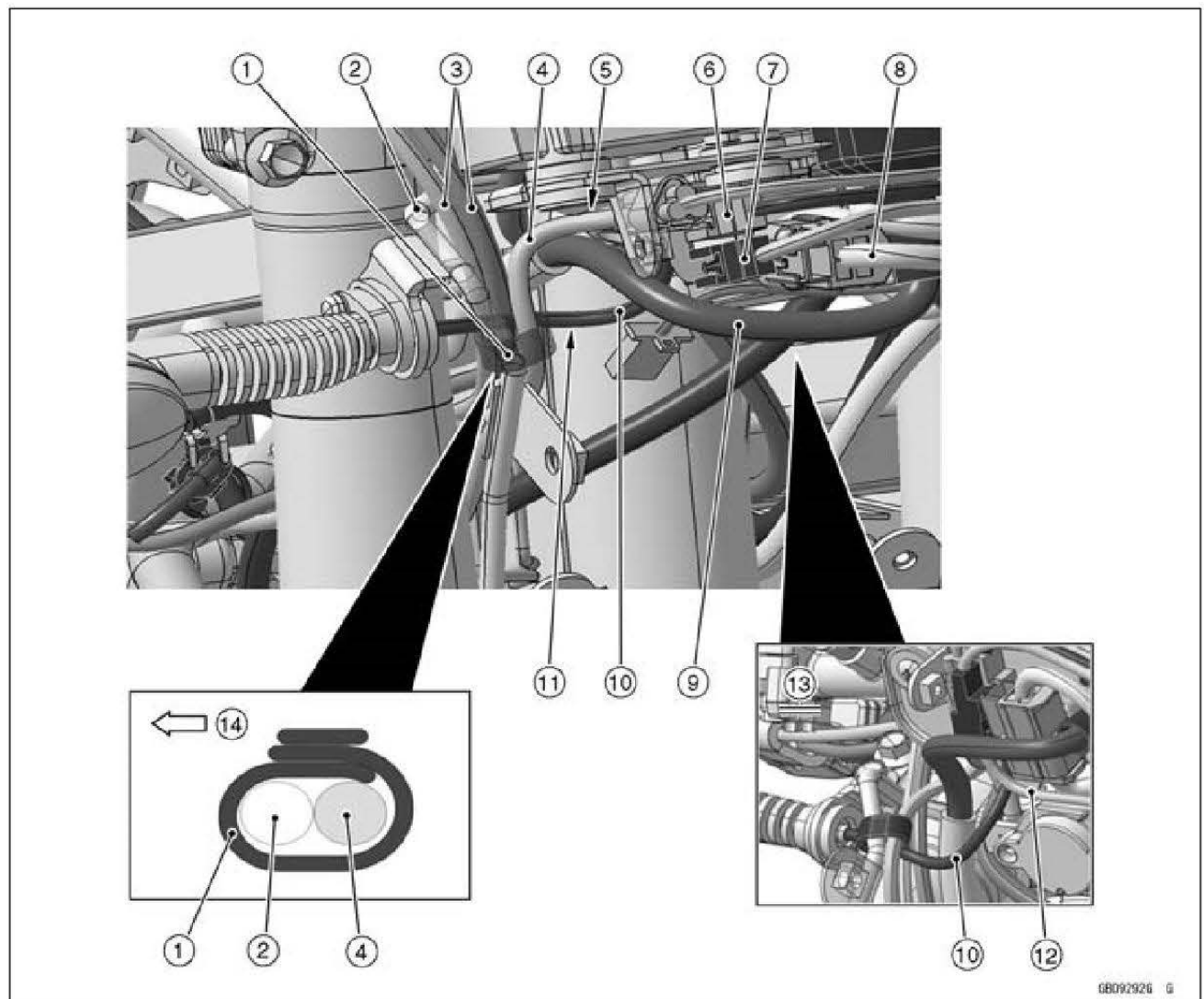
17-4 APPENDIX

Cable, Wire, and Hose Routing



GB052916 G

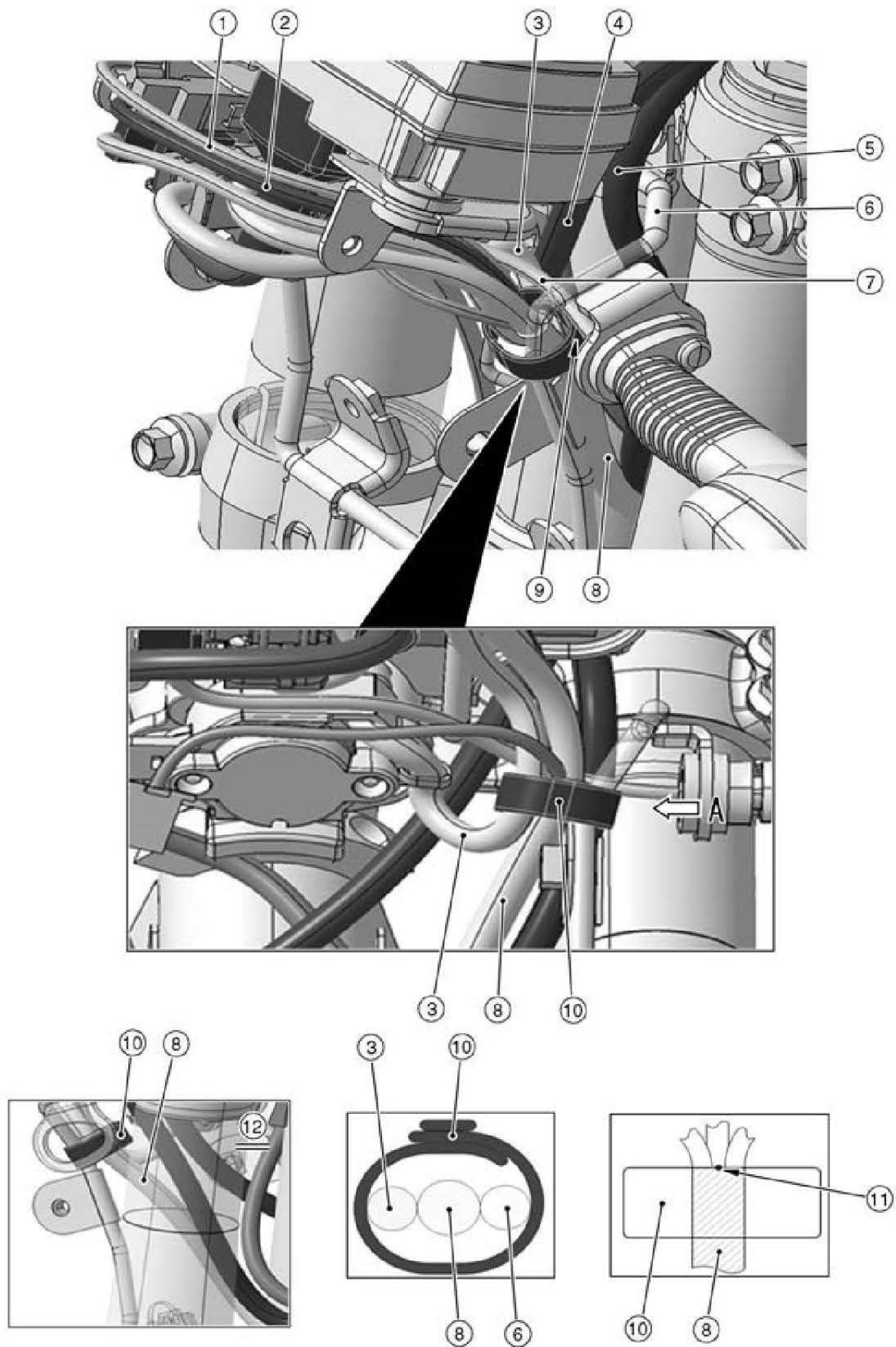
Cable, Wire, and Hose Routing



1. Clamp (Hold the front wheel rotation sensor lead and bracket as shown.)
2. Bracket
3. Throttle Cables
4. Front Wheel Rotation Sensor Lead
5. Run the front wheel rotation sensor lead to the upside of the meter lead.
6. Front Right Turn Signal Light Lead Connector (Install it to the bracket.)
7. Front Left Turn Signal Light Lead Connector (Install it to the bracket.)
8. Ignition Switch Lead Connect
9. Meter Lead
10. Front Right Turn Signal Light Lead
11. Run the front right turn signal light lead to the rear side of the front wheel rotation sensor lead, and run it to the front side of the throttle cables. Run the front right turn signal light lead under the main harness.
12. Front Left Turn Signal Light Lead
13. Viewed from Under
14. Right Side

17-6 APPENDIX

Cable, Wire, and Hose Routing

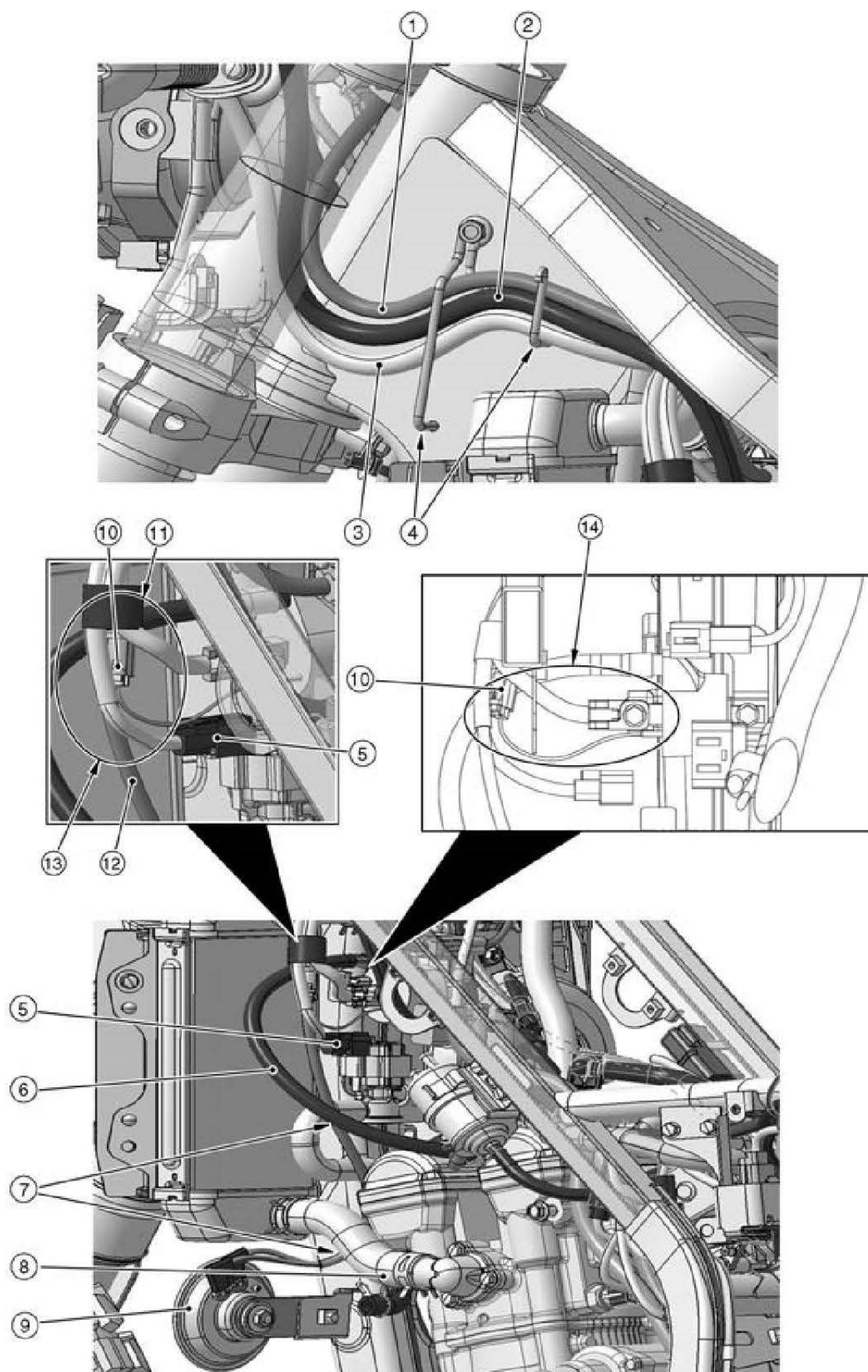


Cable, Wire, and Hose Routing

1. Front Wheel Rotation Sensor Lead
2. Front Right Turn Signal Light Lead
3. Ignition Switch Lead
4. Clutch Cable
5. Left Switch Housing Lead
6. Bracket
7. Front Left Turn Signal Light Lead
8. Main Harness
9. Run the front left turn signal light lead under the main harness, and run it to the front side of the ignition switch lead and left switch housing lead.
10. Clamp (When install the right turn of the handle. Hold the ignition switch lead, main harness and bracket at the position of the harness branch with the front side.)
11. Branch Point
12. Viewed from A

17-8 APPENDIX

Cable, Wire, and Hose Routing

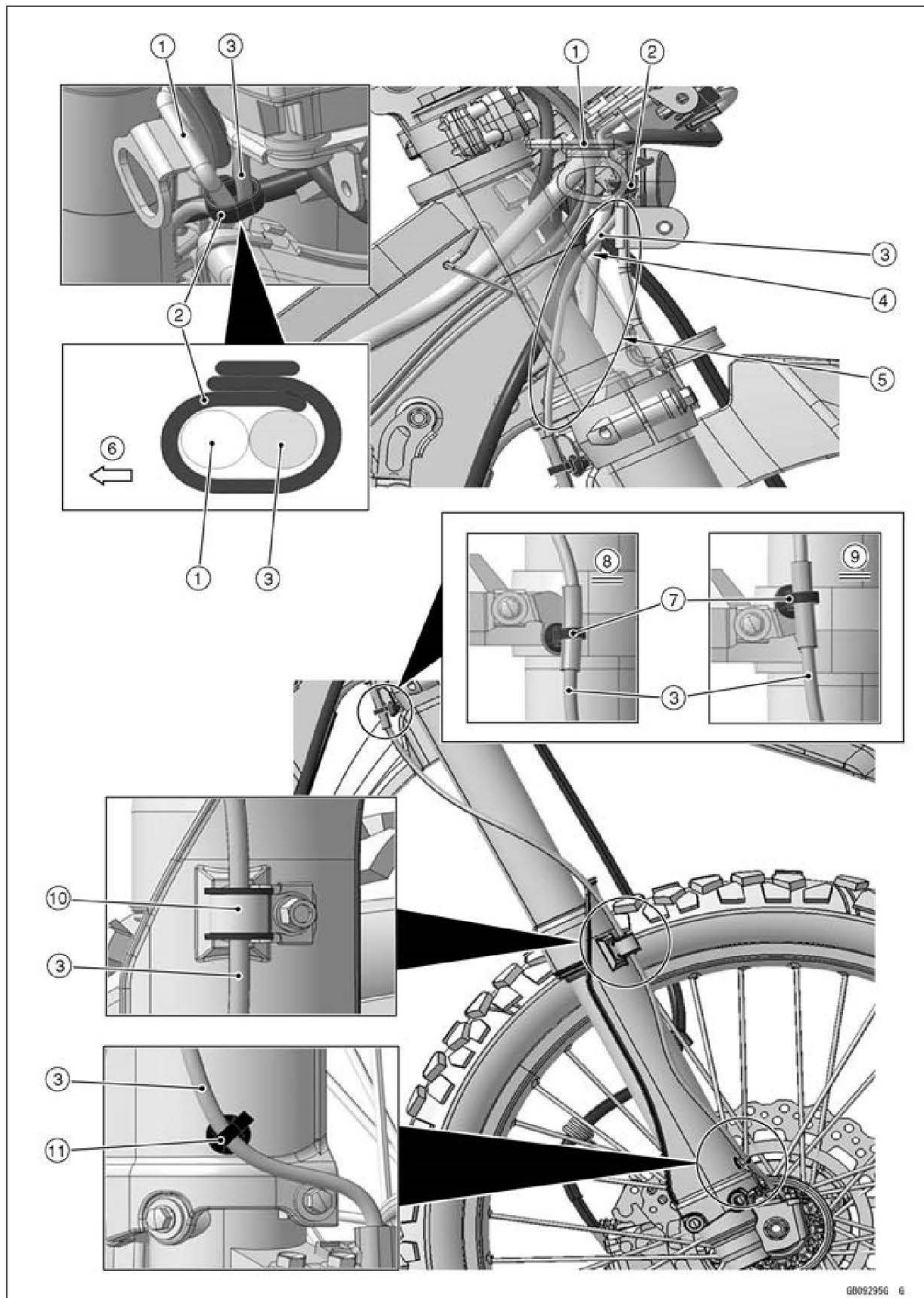


Cable, Wire, and Hose Routing

1. Right Switch Housing Lead
2. Left Switch Housing Lead
3. Main Harness
4. Clamp (Hold the switch housing leads and main harness.)
5. Air Switching Valve Connector
6. Ignition Coil Lead
7. Run the horn leads to the inside of the ignition coil lead, and run it under the water hose.
8. Water Hose
9. Horn
10. Ignition Coil Lead Connector
11. Position the harness branch to the rear side of the ignition coil lead.
12. Horn Lead
13. Run the air switching valve lead to the rear side of the horn lead.
14. Do not touch the ignition coil lead to the main harness.

17-10 APPENDIX

Cable, Wire, and Hose Routing

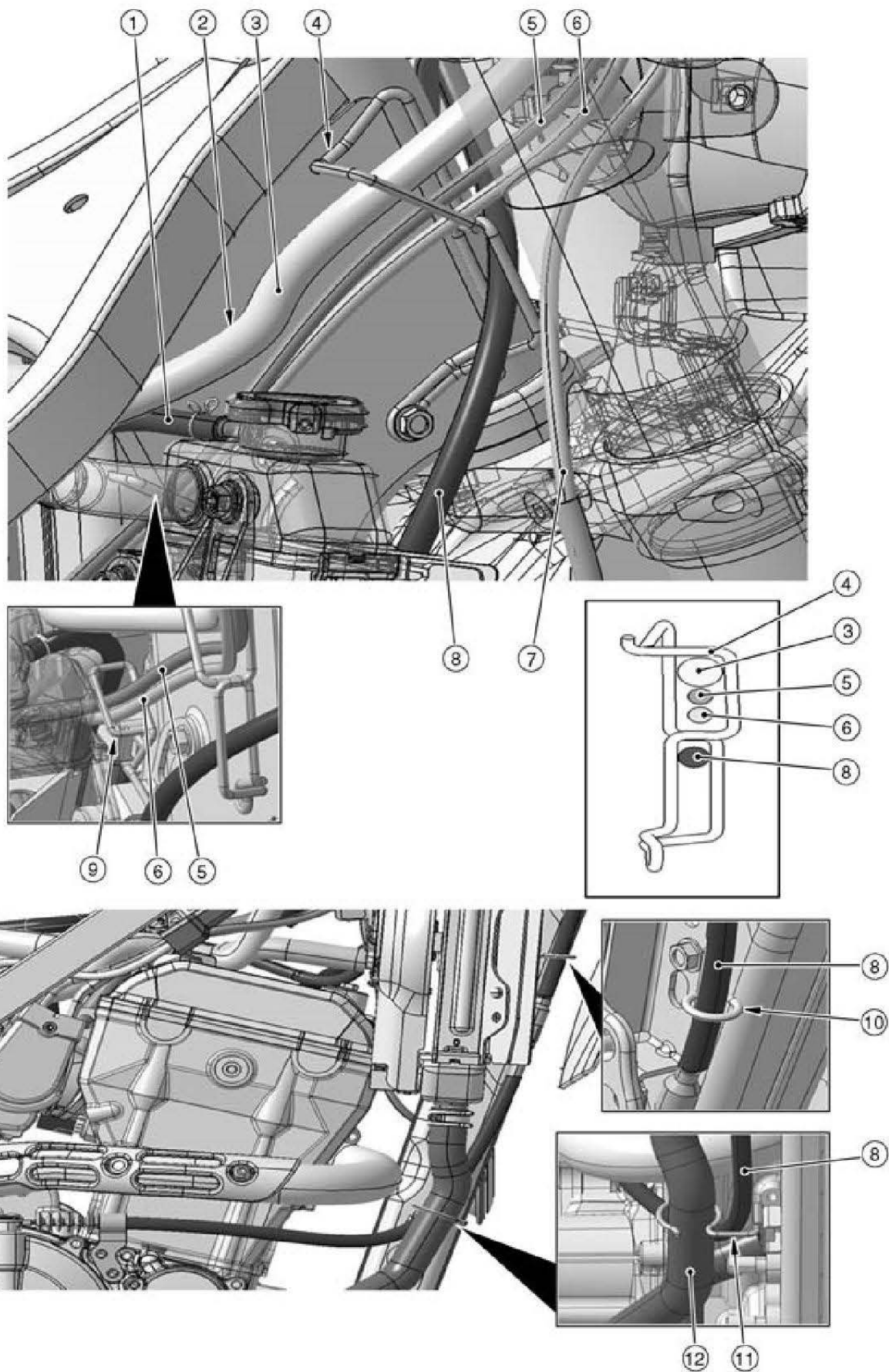


Cable, Wire, and Hose Routing

1. Bracket
2. Clamp (Hold the front wheel rotation sensor lead and bracket.)
3. Front Wheel Rotation Sensor Lead
4. Run the front wheel rotation sensor lead to the inside of the right front fork.
5. Do not loosen the front wheel rotation sensor lead within this range.
6. Right Side
7. Band (Hold the front wheel rotation sensor lead at position the protect tube. Install it to the bracket.)
8. KLX300D
9. KLX300E
10. Clamp (Hold the front wheel rotation sensor lead at position the grommet.)
11. Band (Hold the front wheel rotation sensor lead.)

17-12 APPENDIX

Cable, Wire, and Hose Routing

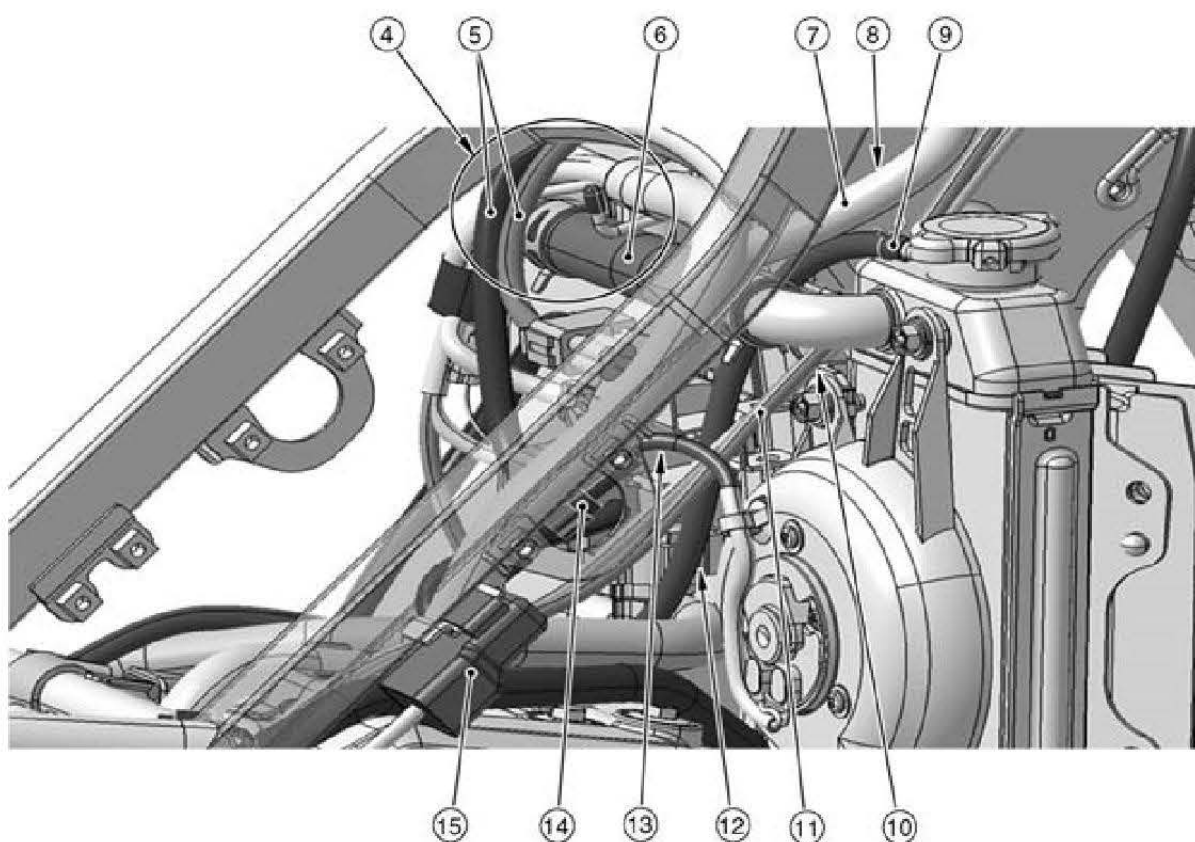
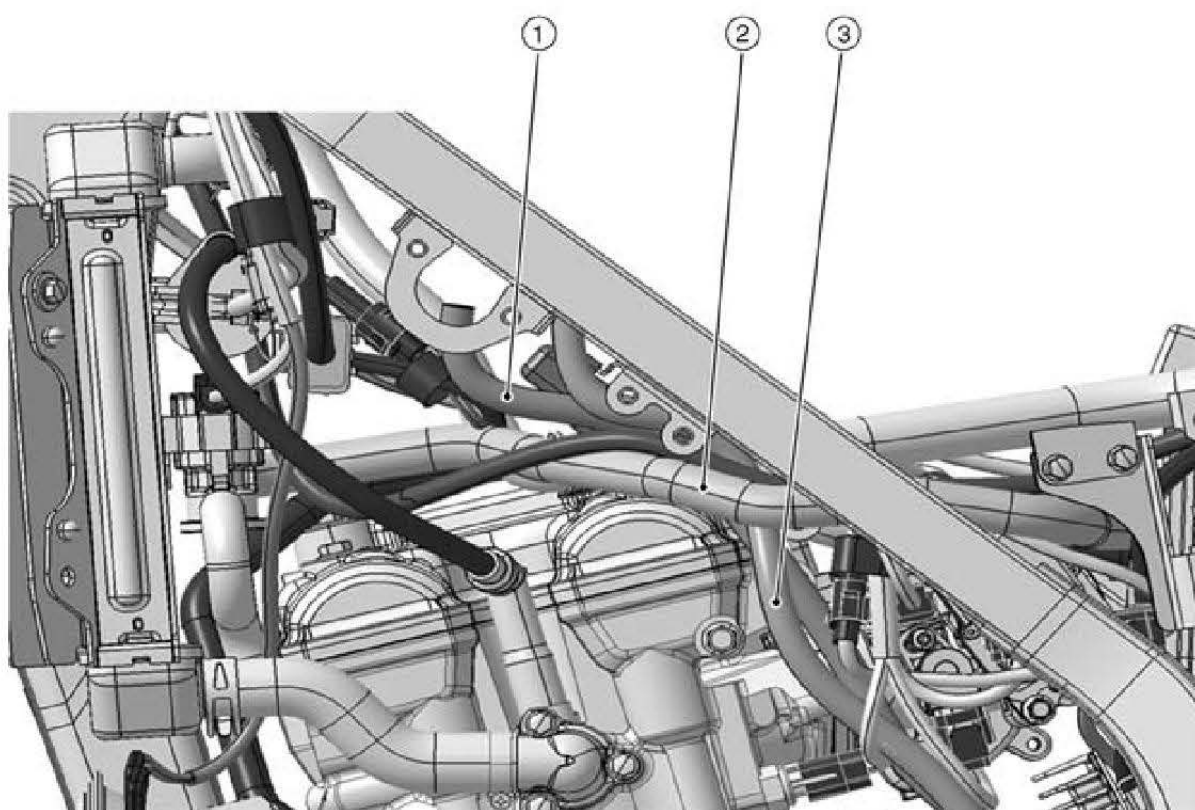


Cable, Wire, and Hose Routing

1. Radiator Overflow Hose
2. Run the main harness to the upside of the radiator overflow hose.
3. Main Harness
4. Clamp (Hold the main harness, throttle cables and clutch cable as shown.)
5. Throttle Cable (Decelerator)
6. Throttle Cable (Accelerator)
7. Front Wheel Rotation Sensor Lead
8. Clutch Cable
9. Run the throttle cables of the clamp.
10. Run the clutch cable of the clamp.
11. Run the clutch cable as shown.
12. Water Hose

17-14 APPENDIX

Cable, Wire, and Hose Routing



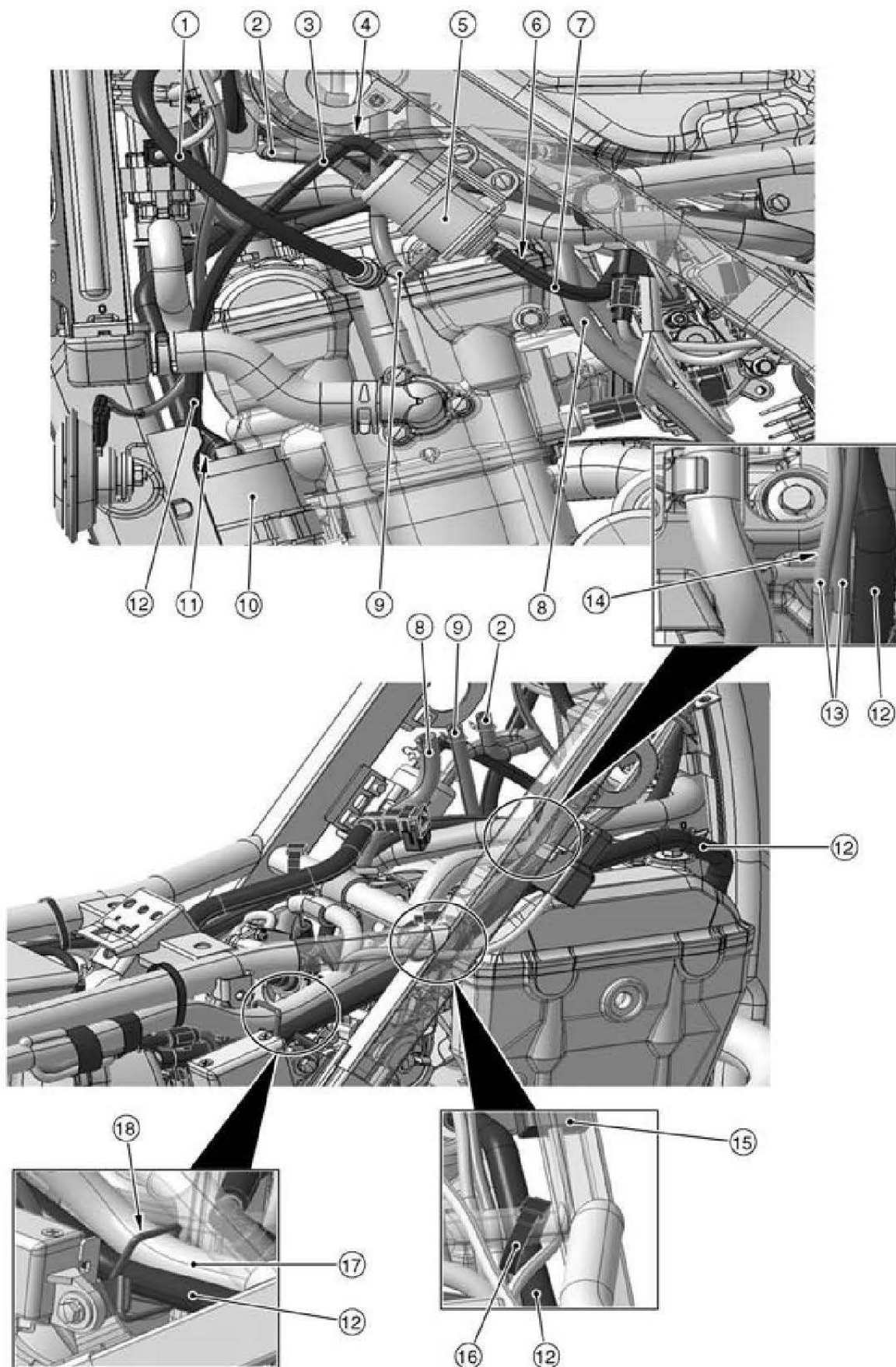
Cable, Wire, and Hose Routing

1. Fuel Tank Breather Hose
2. Air Switching Valve Hose
3. Fuel Tank Drain Hose
4. Run the switch housing leads to the upside of the main harness and water hose.
5. Switch Housing Leads
6. Water Hose
7. Main Harness
8. Run the main harness to the upside of the radiator overflow hose.
9. Radiator Overflow Hose
10. Run the throttle cables under the radiator overflow hose.
11. Throttle Cables
12. Run the radiator overflow hose under the water hose and switch housing leads.
13. Run the radiator fan motor lead under the main harness, and run it to the upside of the throttle cables.
14. Radiator Fan Motor Lead
15. Fuel Pump Lead Connector (Install it to the frame bracket.)

17-16 APPENDIX

Cable, Wire, and Hose Routing

CAL Model

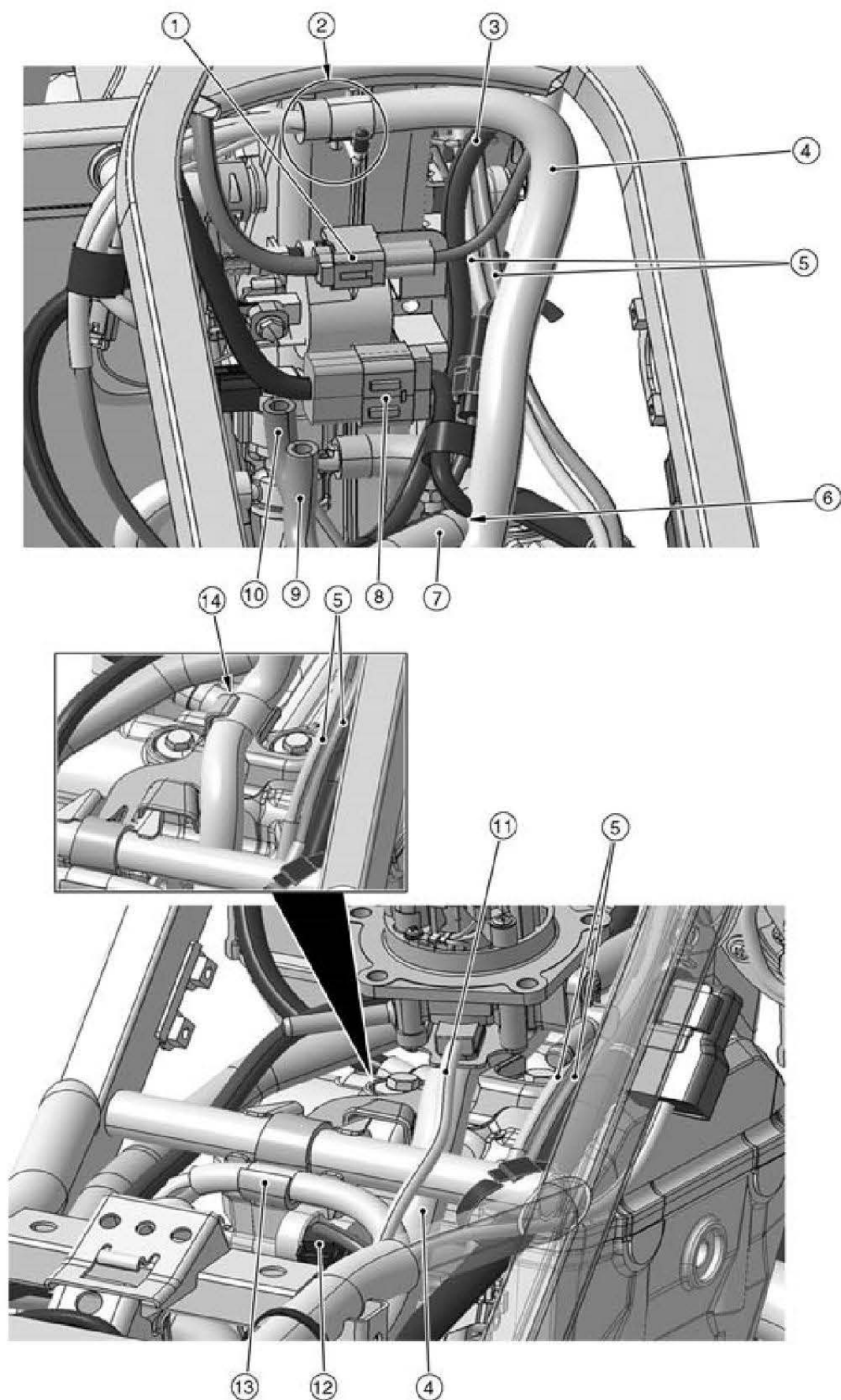


Cable, Wire, and Hose Routing

1. Ignition Coil Lead
2. Fuel Tank Breather Hose
3. Hose (Separator ~ Canister)
4. Run the hose (separator ~ canister) to the inside of the ignition coil lead.
5. Separator
6. Run the hose (separator ~ throttle body assy) to the upside of the fuel tank drain hose.
7. Hose (Separator ~ Throttle Body Assy)
8. Fuel Tank Drain Hose
9. Fuel Return Hose
10. Canister
11. Run the hose (canister ~ air cleaner) under the frame pipe and main harness.
12. Hose (Canister ~ Air Cleaner)
13. Throttle Cables
14. Run the hose (canister ~ air cleaner) to the right side of the throttle cables.
15. Fuel Pump Relay
16. Band (Hold the hose (canister ~ air cleaner) under the frame pipe.)
17. Main Harness
18. Clamp (Hold the main harness and hose (canister ~ air cleaner). Run the hose (canister ~ air cleaner) to the inside of the main harness.)

17-18 APPENDIX

Cable, Wire, and Hose Routing

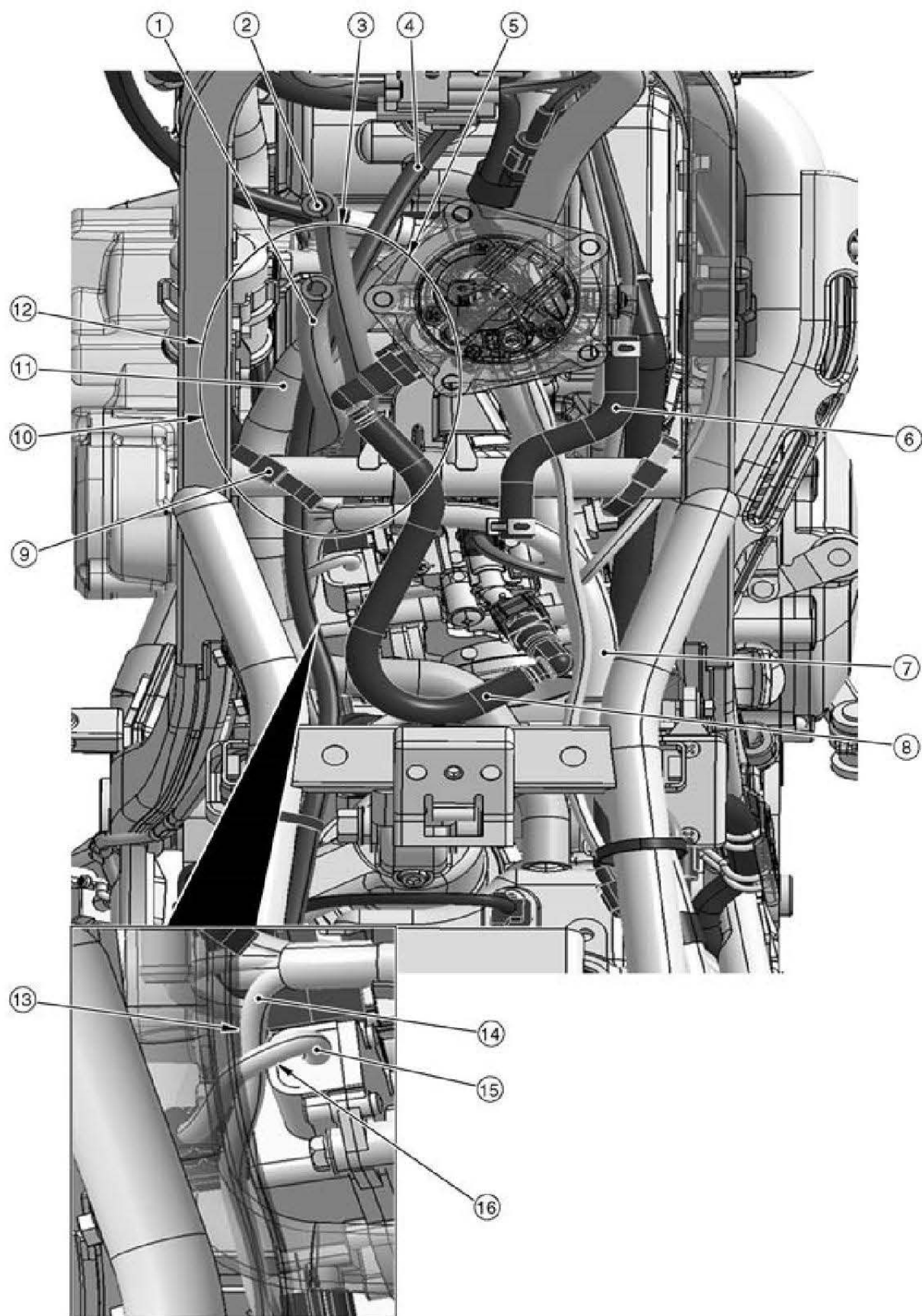


Cable, Wire, and Hose Routing

1. Right Switch Housing Lead Connector (Install it to the bracket.)
2. Align the white tape of the main harness with the hook.
3. Radiator Overflow Hose
4. Main Harness
5. Throttle Cables
6. Run the air switching valve hose under the main harness.
7. Air Switching Valve Hose
8. Left Switch Housing Lead Connector (Install it to the bracket.)
9. Fuel Tank Drain Hose
10. Fuel Tank Breather Hose
11. Fuel Pump Lead
12. Injector
13. Clamp (Hold the main harness and frame pipe at the position white tape with the main harness.)
14. Clamp (Hold the main harness at the position white tape with the main harness.)

17-20 APPENDIX

Cable, Wire, and Hose Routing

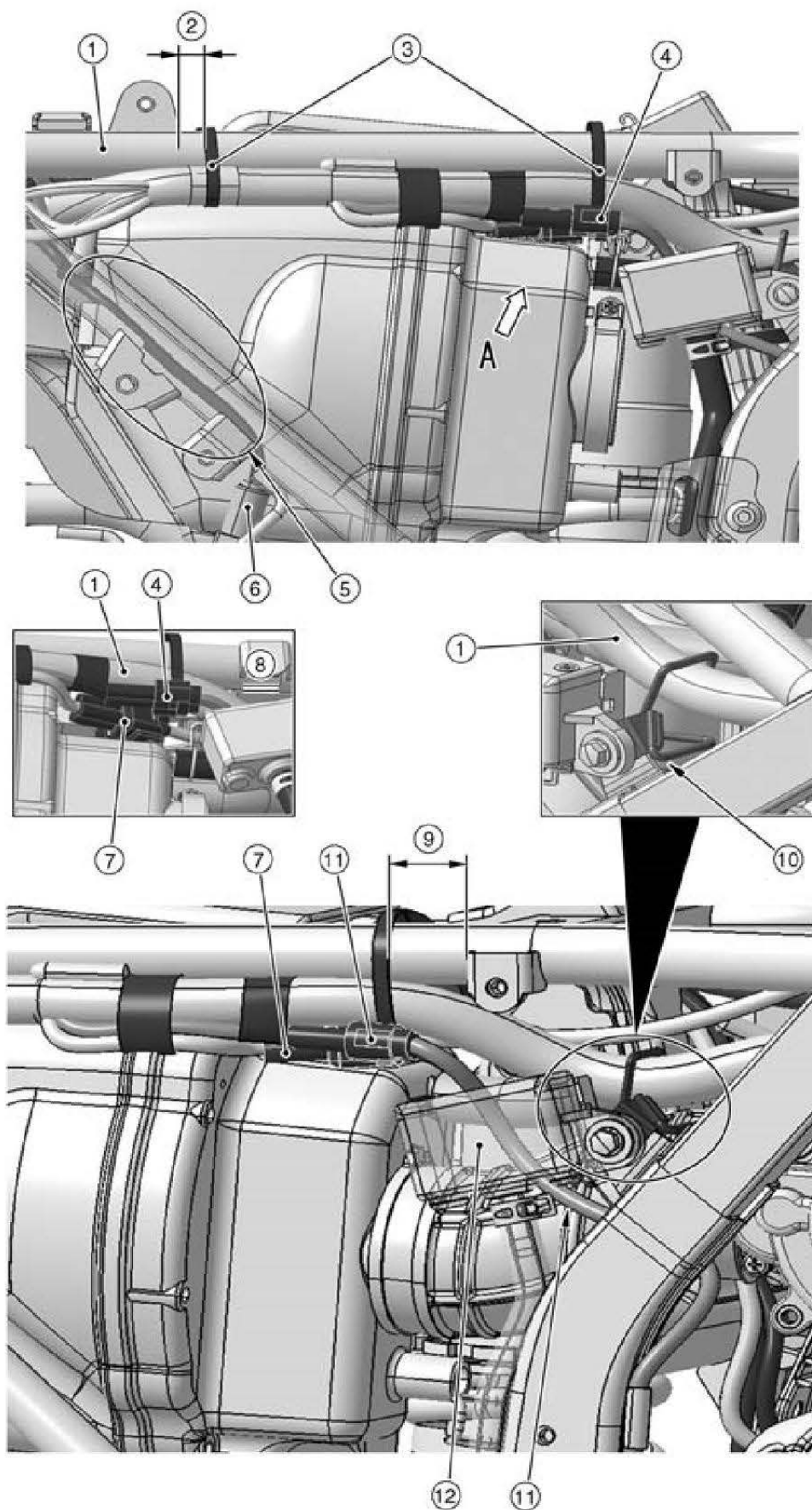


Cable, Wire, and Hose Routing

1. Fuel Tank Breather Hose
2. Reserve Tank Overflow Hose
3. Run the reserve tank overflow hoses to the inside of the air switching valve lead.
4. Radiator Overflow Hose
5. Run the radiator overflow hose under the frame pipe, above the air switching valve hose, and run it to the outside of the reserve tank overflow hoses and fuel tank breather hose.
6. Fuel Bypass Hose
7. Main Harness
8. Fuel Hose
9. Band (Hold the air switching valve hose, radiator overflow hose and frame pipe.)
10. Run the air switching valve hose under the pipe, and run it to the outside of the reserve tank overflow hose tube and fuel tank breather hose.
11. Air Switching Valve Hose
12. Run the fuel tank breather hose to the inside of the air switching valve lead and radiator overflow hose.
13. Run the subthrottle valve actuator lead to the upside of the subthrottle sensor lead, and run it under the radiator overflow hose and air switching valve lead.
14. Subthrottle Valve Actuator Lead
15. Subthrottle Sensor Lead
16. Run the subthrottle sensor lead under the subthrottle valve actuator lead, and run it under the air switching valve lead.

17-22 APPENDIX

Cable, Wire, and Hose Routing

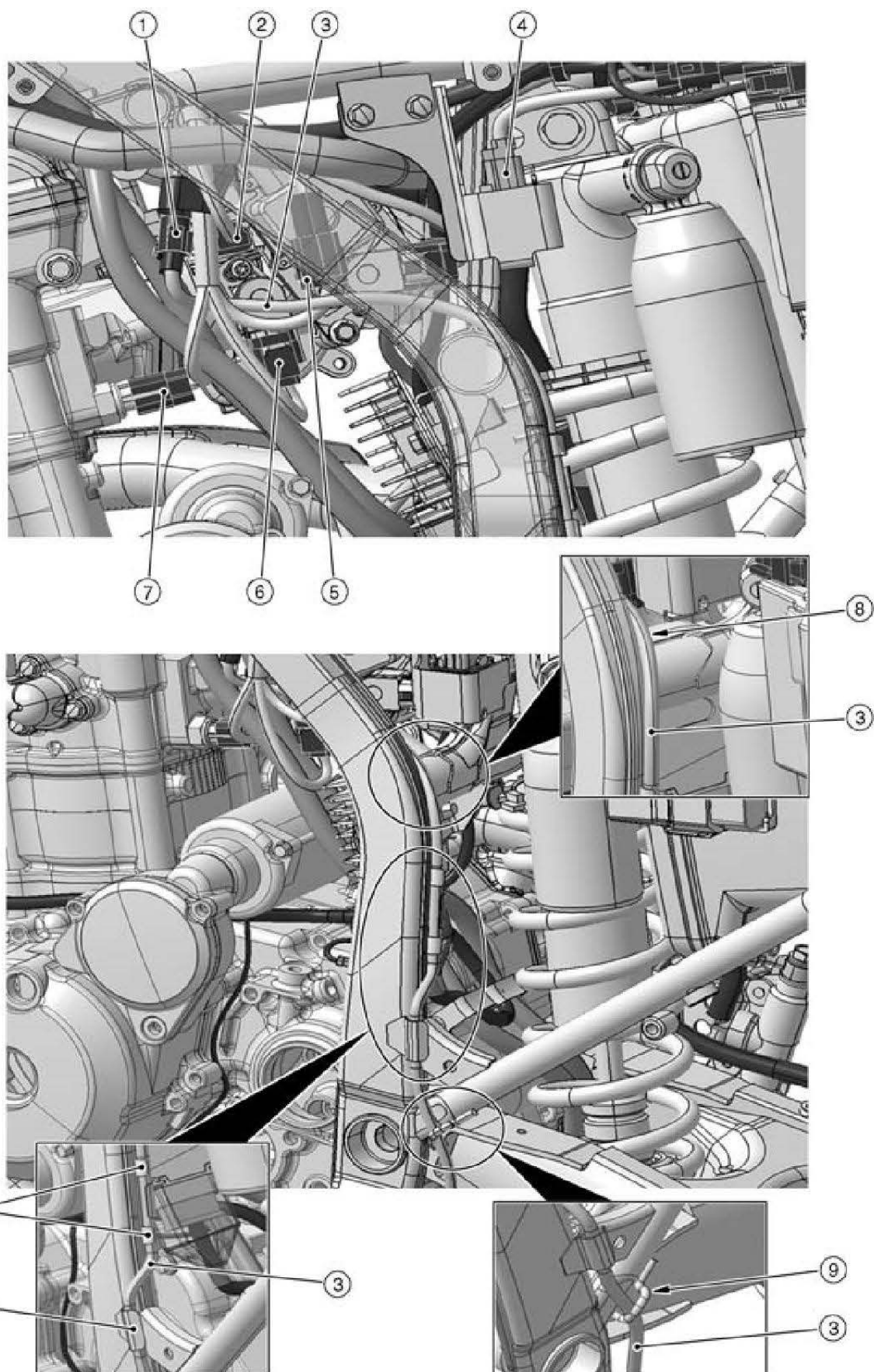


Cable, Wire, and Hose Routing

1. Main harness
2. About 5 ~ 10 mm (0.20 ~ 0.39 in.)
3. Bands (Hold the main harness and frame pipe. Cut the band keeping about 20 mm (0.79 in.).)
4. Rear Brake Light Switch Lead Connector
5. Run the oxygen sensor lead along the frame pipe, and run it to the right side of the air cleaner box. Do not loose the oxygen sensor lead.
6. Oxygen Sensor
7. Fuel Pump Sensor Lead Connector (Position it to the upside of the air cleaner box.)
8. Viewed from A
9. About 10 ~ 20 mm (0.39 ~ 0.79 in.)
10. Clamp (Hold the main harness.)
11. Run the rear brake switch lead to the inside of the rear brake reservoir tank and frame.
12. Rear Brake Reservoir Tank

17-24 APPENDIX

Cable, Wire, and Hose Routing

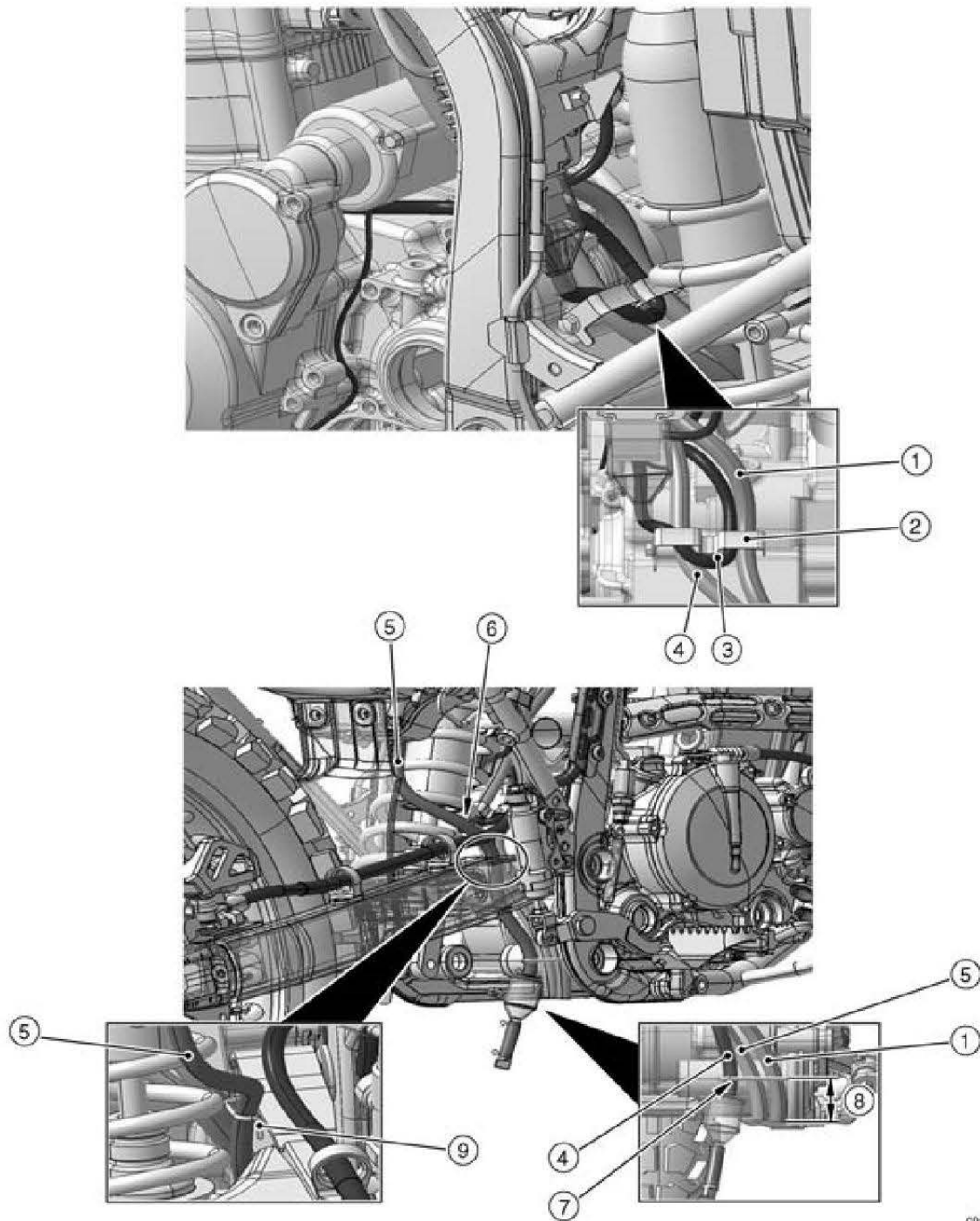


Cable, Wire, and Hose Routing

1. Side Stand Switch Lead Connector
2. Intake Air Pressure Sensor Lead
3. Side Stand Switch Lead
4. Vehicle-down Sensor Connector
5. Subthrottle Actuator Lead Connector
6. Main Throttle Sensor Connector
7. Water Temperature Sensor Connector
8. Run the side stand switch lead to the upside of the frame pipe.
9. Guide (Hold the side stand switch lead.)

17-26 APPENDIX

Cable, Wire, and Hose Routing

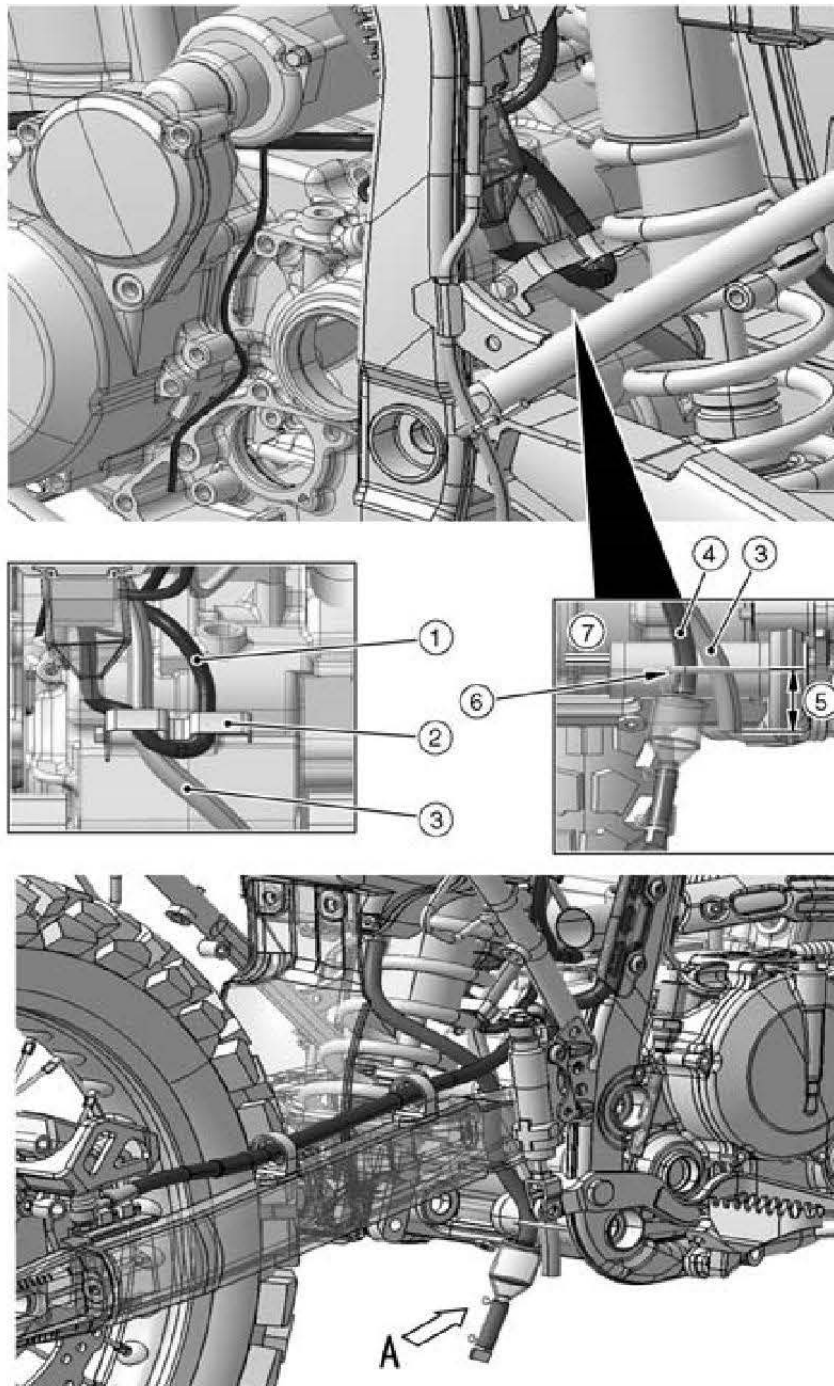


60093036 6

1. Fuel Tank Breather Hose
2. Clamp
3. Regulator/Rectifier Lead
4. Fuel Tank Drain Hose
5. Air Cleaner Drain Hose
6. Run the air cleaner drain hose to the right side of the rear shock absorber.
7. Run the fuel tank breather hose, fuel tank drain hose and air cleaner drain hose of the guide.
8. 30 ~ 40 mm (1.18 ~ 1.57 in.)
9. Clamp (Hold the air cleaner drain hose.)

Cable, Wire, and Hose Routing

CAL Model

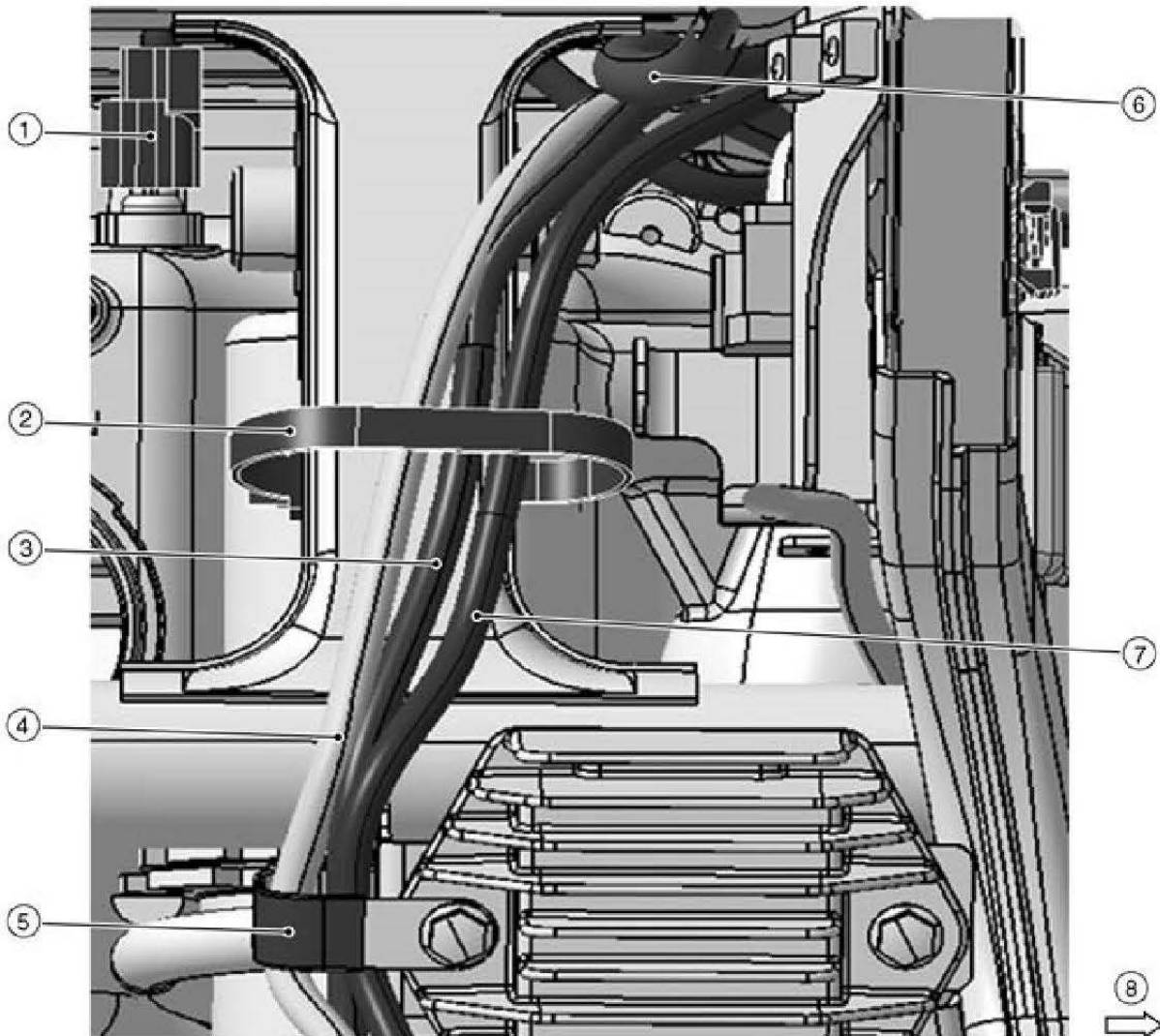


GB093046 G

1. Regulator/Rectifier Lead
2. Clamp
3. Fuel Tank Drain Hose
4. Air Cleaner Drain Hose
5. 30 ~ 40 mm (1.18 ~ 1.57 in.)
6. Run the fuel tank drain hose and air cleaner drain hose of the guide.
7. Viewed from A

17-28 APPENDIX

Cable, Wire, and Hose Routing



60093056 6

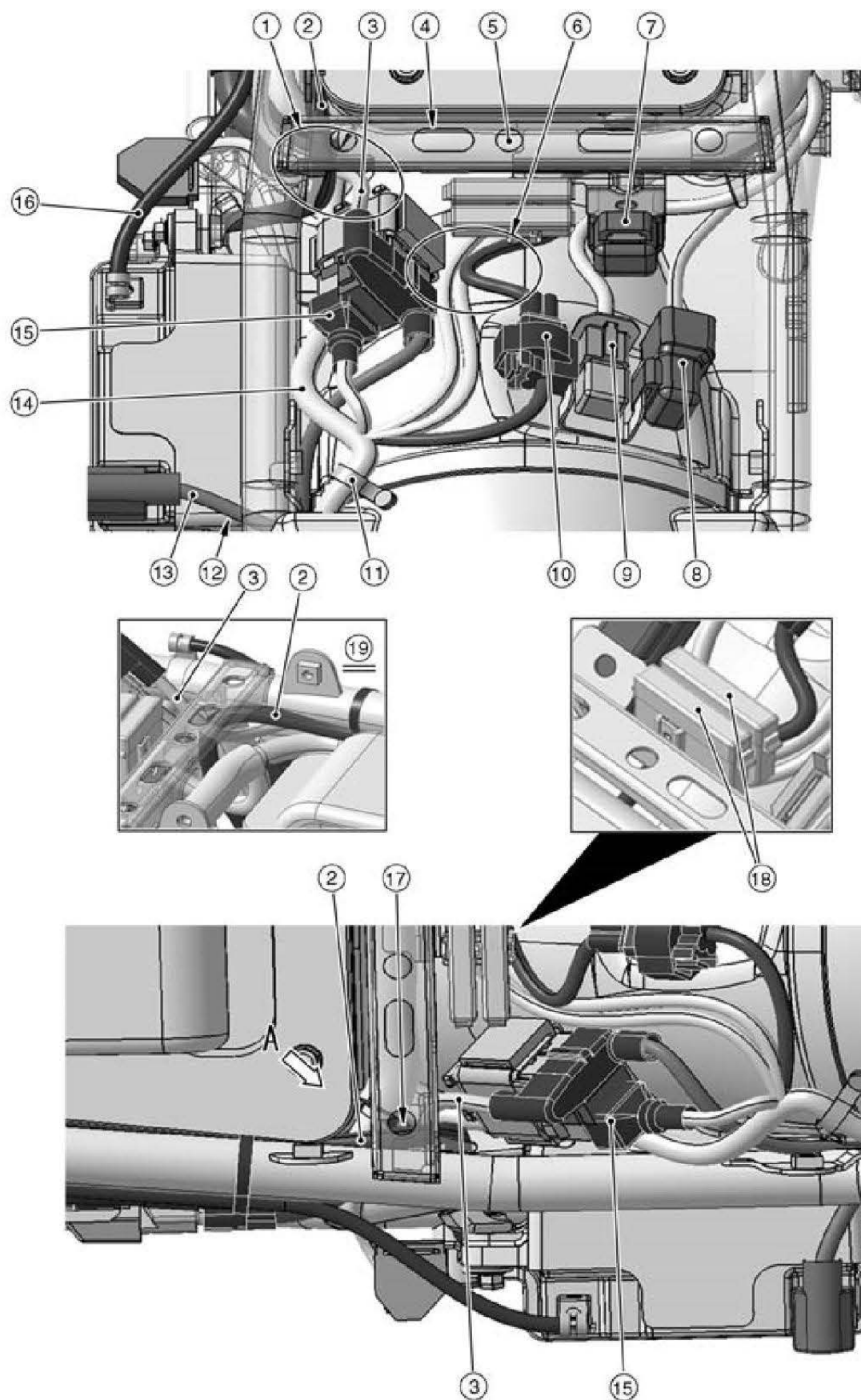
1. Intake Air Temperature Sensor
2. Band (Hold the regulator/rectifier lead, battery negative (-) cable, starter motor cable and frame. Cut the band keeping about 20 mm (0.79 in.).)
3. Battery Negative (-) Cable
4. Starter Motor Cable
5. Clamp (Hold the regulator/rectifier lead, battery negative (-) cable and starter motor cable. Band the clamp rearward.)
6. Reserve Tank Overflow Hose
7. Regulator/Rectifier Lead
8. Left Side

Cable, Wire, and Hose Routing

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17-30 APPENDIX

Cable, Wire, and Hose Routing

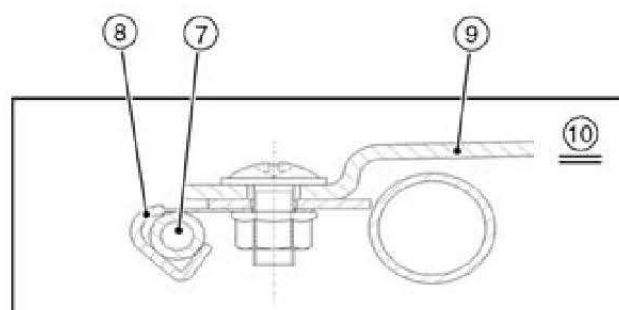
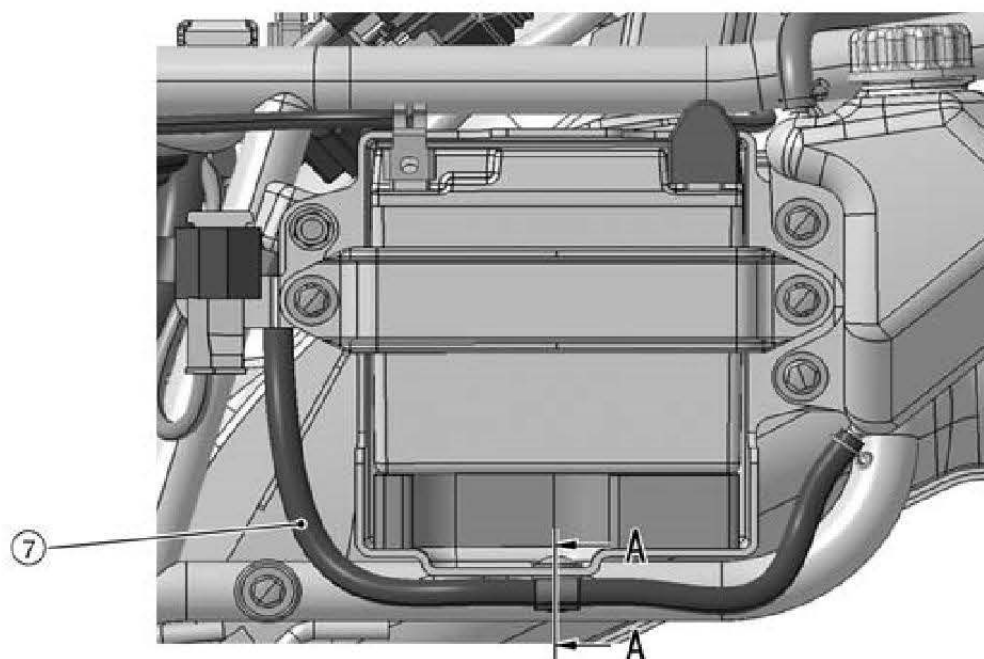
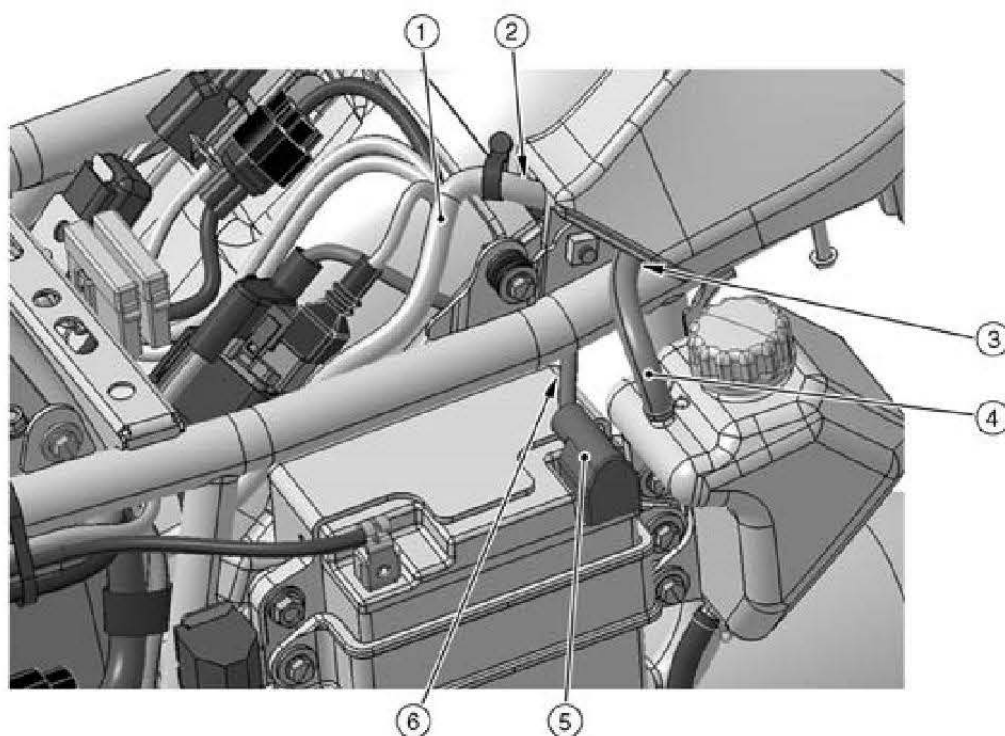


Cable, Wire, and Hose Routing

1. Run the starter motor cable under the reserve tank overflow hose
2. Reserve Tank Overflow Hose
3. Starter Motor Cable
4. Run the main harness to the rear side of the air cleaner cap.
5. Main Harness
6. Pull the oxygen sensor lead to place it leads as near as starter relay.
7. Fan Relay (Install it to the bracket.)
8. Starter Circuit Relay (Install it to the bracket.)
9. Side Stand Switch Connector (Install it to the bracket.)
10. Oxygen Sensor Lead Connector
11. Clamp (Hold the main harness. Install it to the rear fender.)
12. Run the battery positive (+) cable under the main harness and frame pipe.
13. Battery Positive (+) Cable
14. Main Harness
15. Starter Relay
16. Battery Negative (–) Cable
17. Run the reserve tank overflow hose to the inside of the frame pipe, and run it to the upside of the starter motor cable. Run the reserve tank overflow under the frame bracket.
18. Fuse Box (Install it to the bracket.)
19. Viewed from A

17-32 APPENDIX

Cable, Wire, and Hose Routing

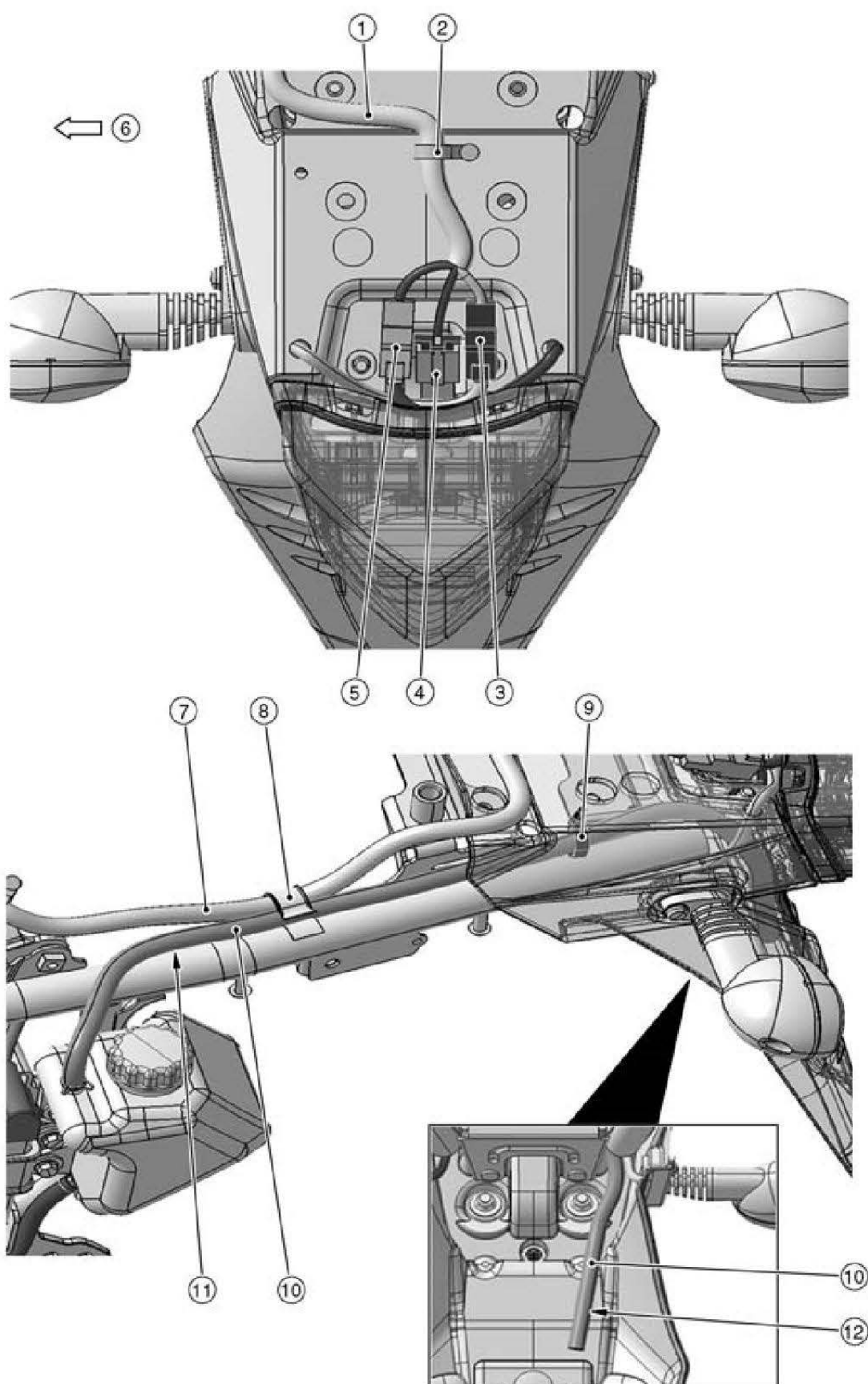


Cable, Wire, and Hose Routing

1. Main Harness
2. Run the main harness under the rear fender.
3. Run the reserve tank overflow hose to the upside of the frame pipe, and run it under the rear fender.
4. Reserve Tank Overflow Hose
5. Battery Positive (+) Cable
6. Run the battery positive (+) cable under the main harness and frame pipe.
7. Radiator Overflow Hose
8. Clamp (Hold the radiator overflow hose.)
9. Battery Case
10. Section A-A

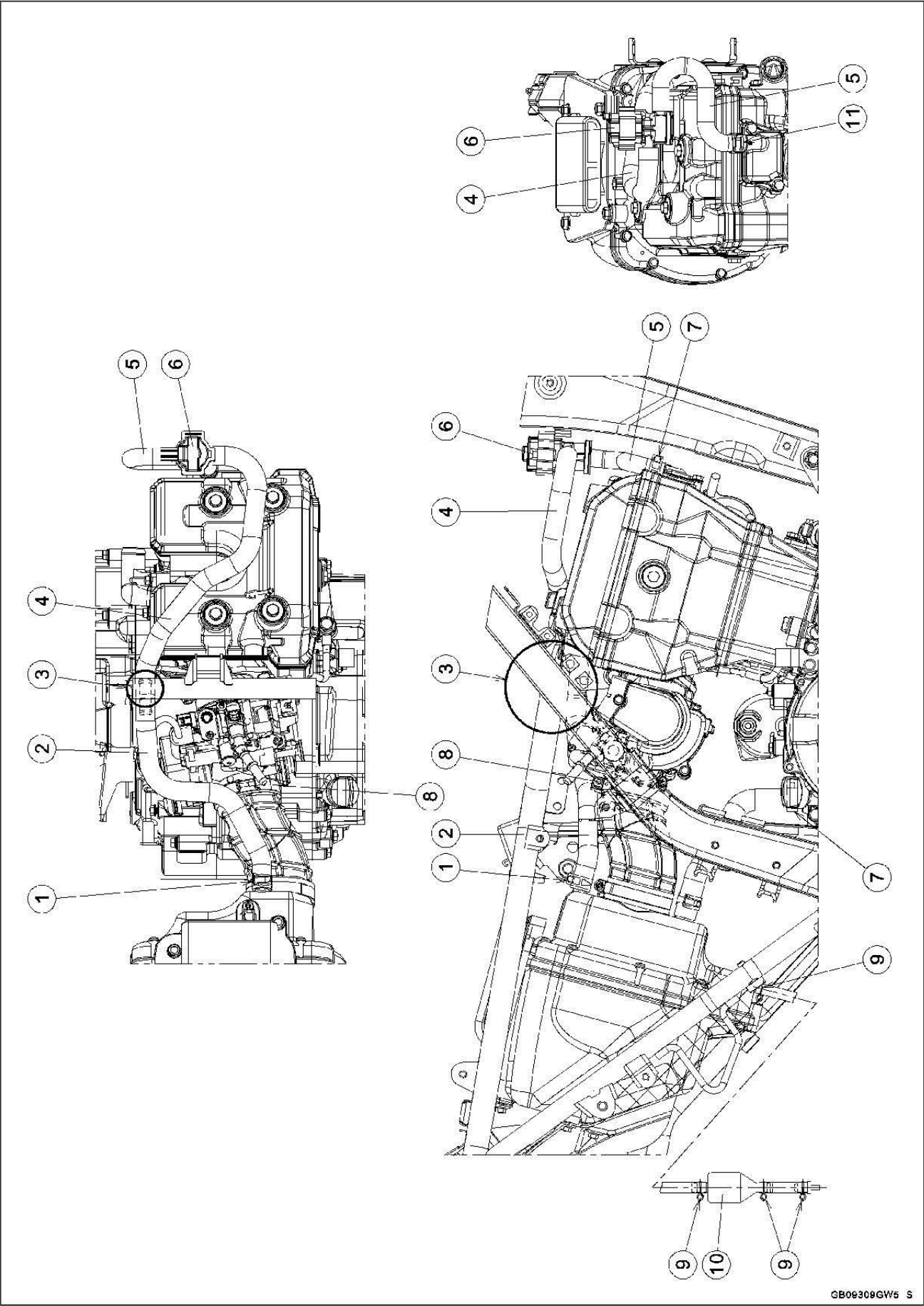
17-34 APPENDIX

Cable, Wire, and Hose Routing



Cable, Wire, and Hose Routing

1. Main Harness
2. Clamp (Hold the main harness, and install it to the bracket.)
3. Rear Left Turn Signal Light Lead Connector
4. Brake/Tail Light Lead Connector
5. Rear Right Turn Signal Light Lead Connector
6. Left Side
7. Main Harness
8. Clamp (Hold the main harness and reserve tank overflow hose.)
9. Clamp (Hold the reserve tank overflow hose. Install the clamp under the flap.)
10. Reserve Tank Overflow Hose
11. Run the reserve tank overflow hose along to the left side of the frame pipe.
12. Run the reserve tank overflow hose to the inside of the flap.

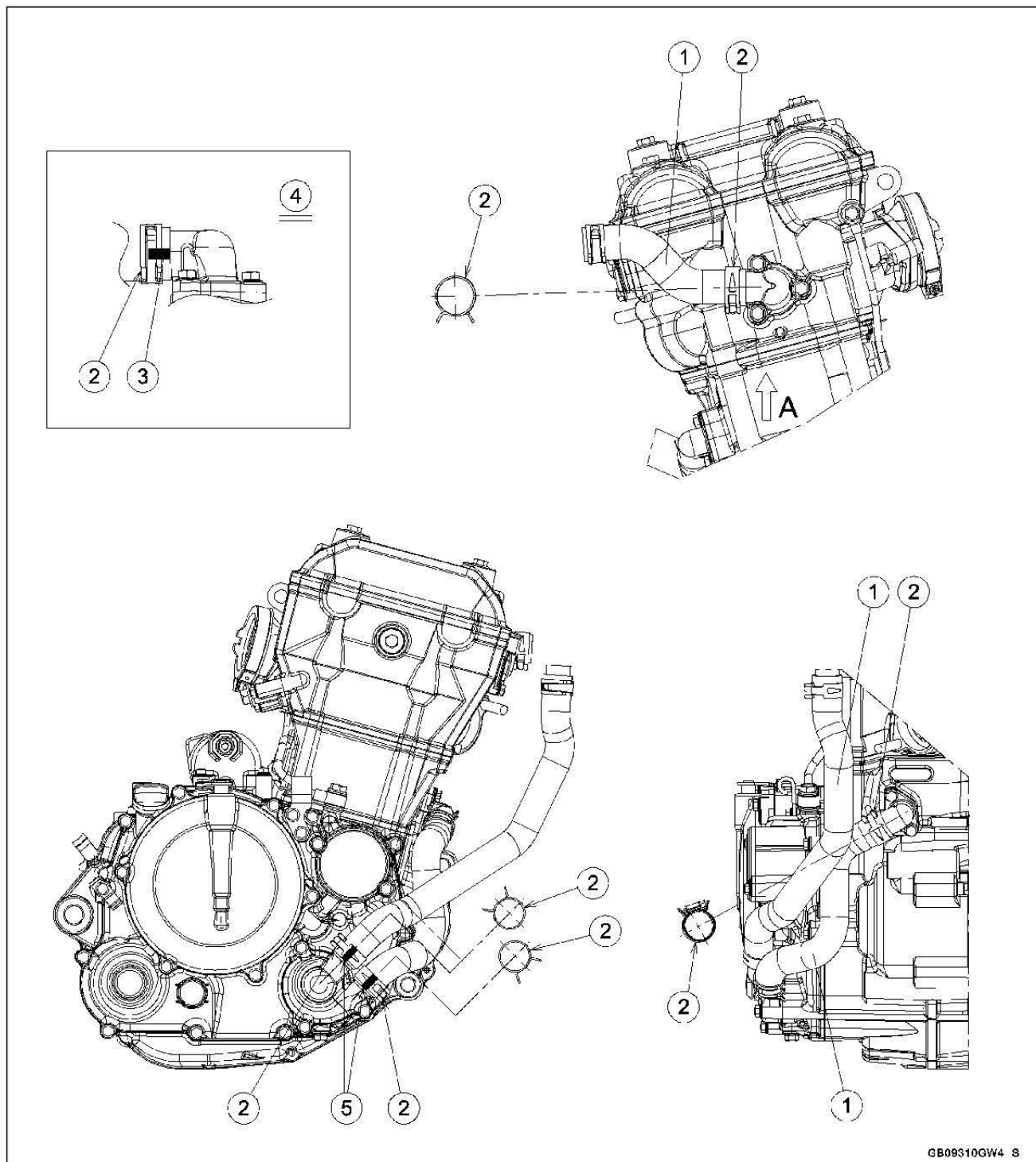


Cable, Wire, and Hose Routing

1. Clamp (Face its knob upward.)
2. Air Switching Valve Hose (Fitting ~ Air Cleaner Housing)
3. Run the air switching valve hose under the frame pipe.
4. Air Switching Valve Hose (Air Suction Valve ~ Fitting)
5. Air Switching Valve Hose (Air Suction Valve Cover ~ Air Suction Valve)
6. Air Switching Valve
7. Clamps (Face its knob forward.)
8. Clamp (Face its clamp screw upward.)
9. Clamps (Face its knob backward.)
10. Catch Tank
11. Clamp (Face its knob rightward.)

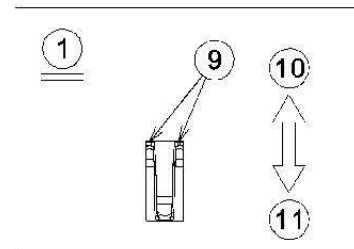
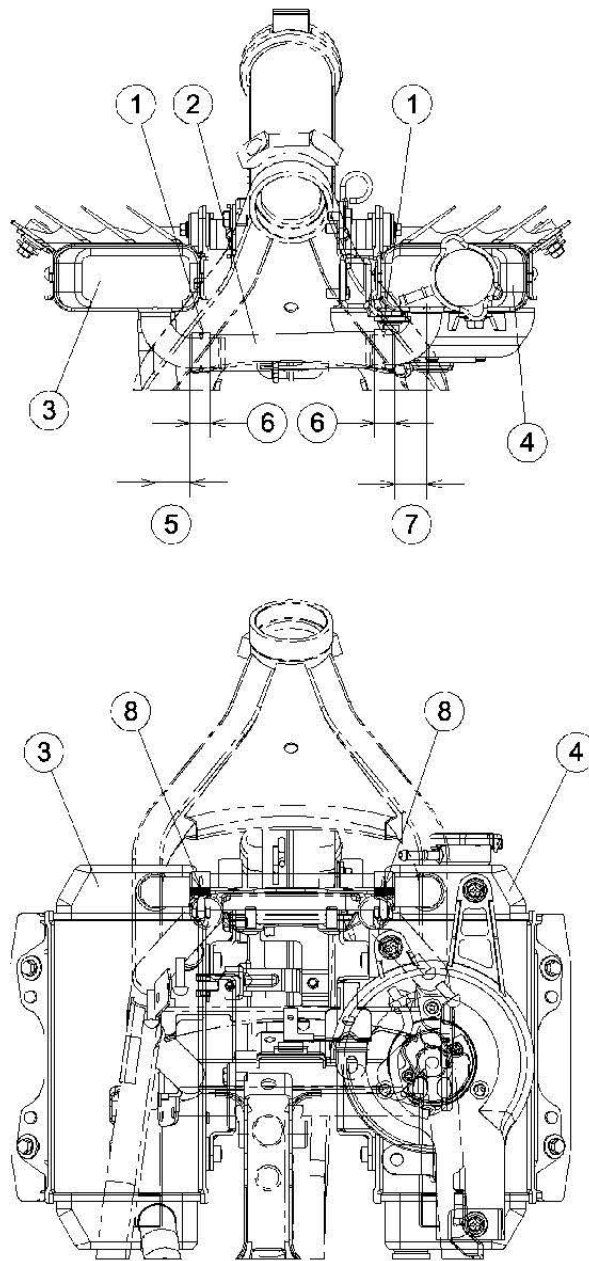
17-38 APPENDIX

Cable, Wire, and Hose Routing



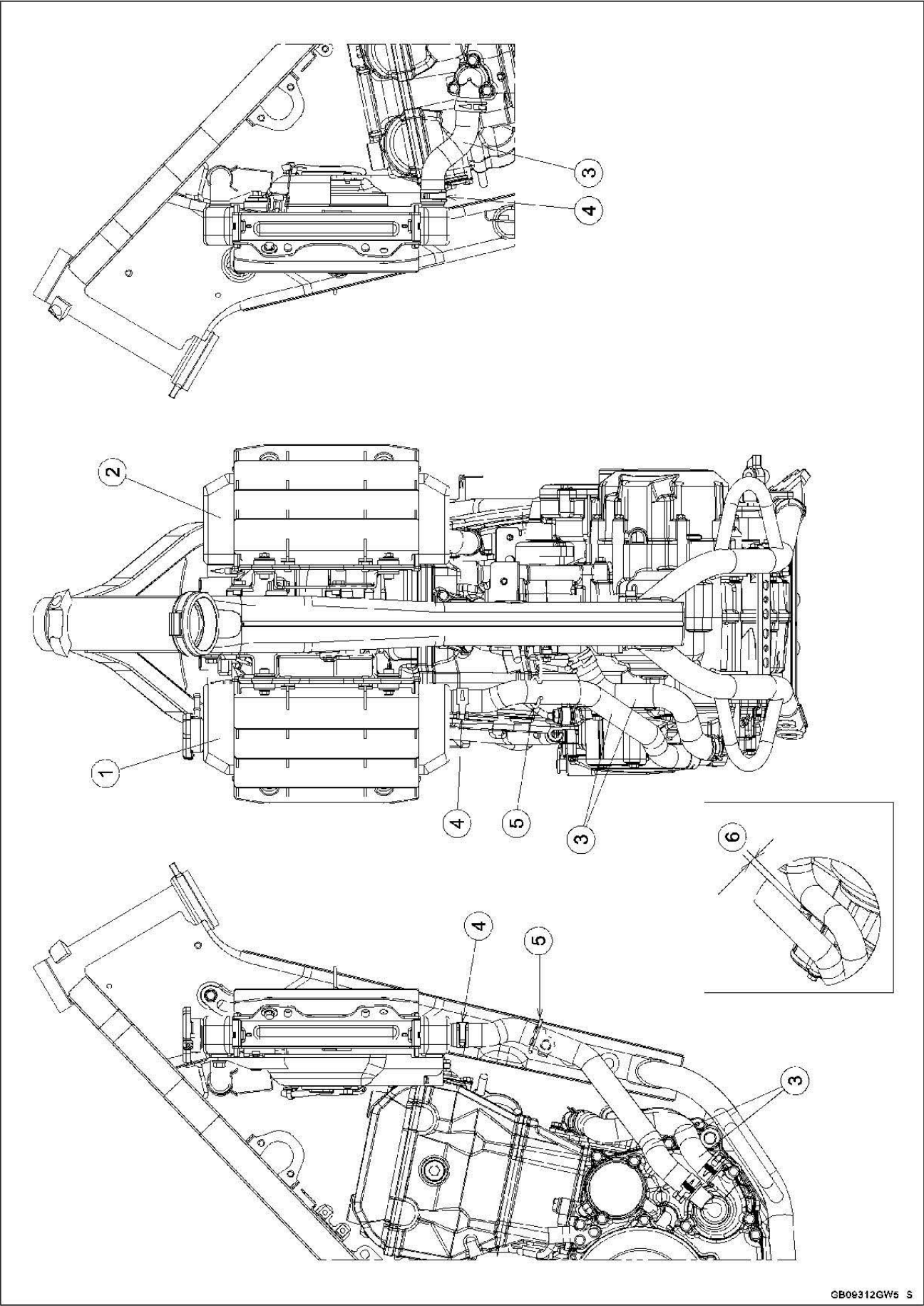
1. Water Hoses
2. Install the clamps as shown.
3. Install the water hose so that the white paint mark faces to lower side.
4. Viewed from A
5. Install the water hoses so that the white paint marks face to outside.

Cable, Wire, and Hose Routing



GB09311GW4 S

1. Clamps (Face its knob downward.)
2. Water Hose
3. Left Radiator
4. Right Radiator
5. Hose: 23 mm (0.9 in.)
6. Clamp: 12.5 ~ 14.5 mm (0.49 ~ 0.57 in.)
7. Hose: 21 mm (0.83 in.)
8. Keep the clamps position within the end line of white paint mark.
9. Install the clamps so that the two legs side of the knob face to backward.
10. Back
11. Front

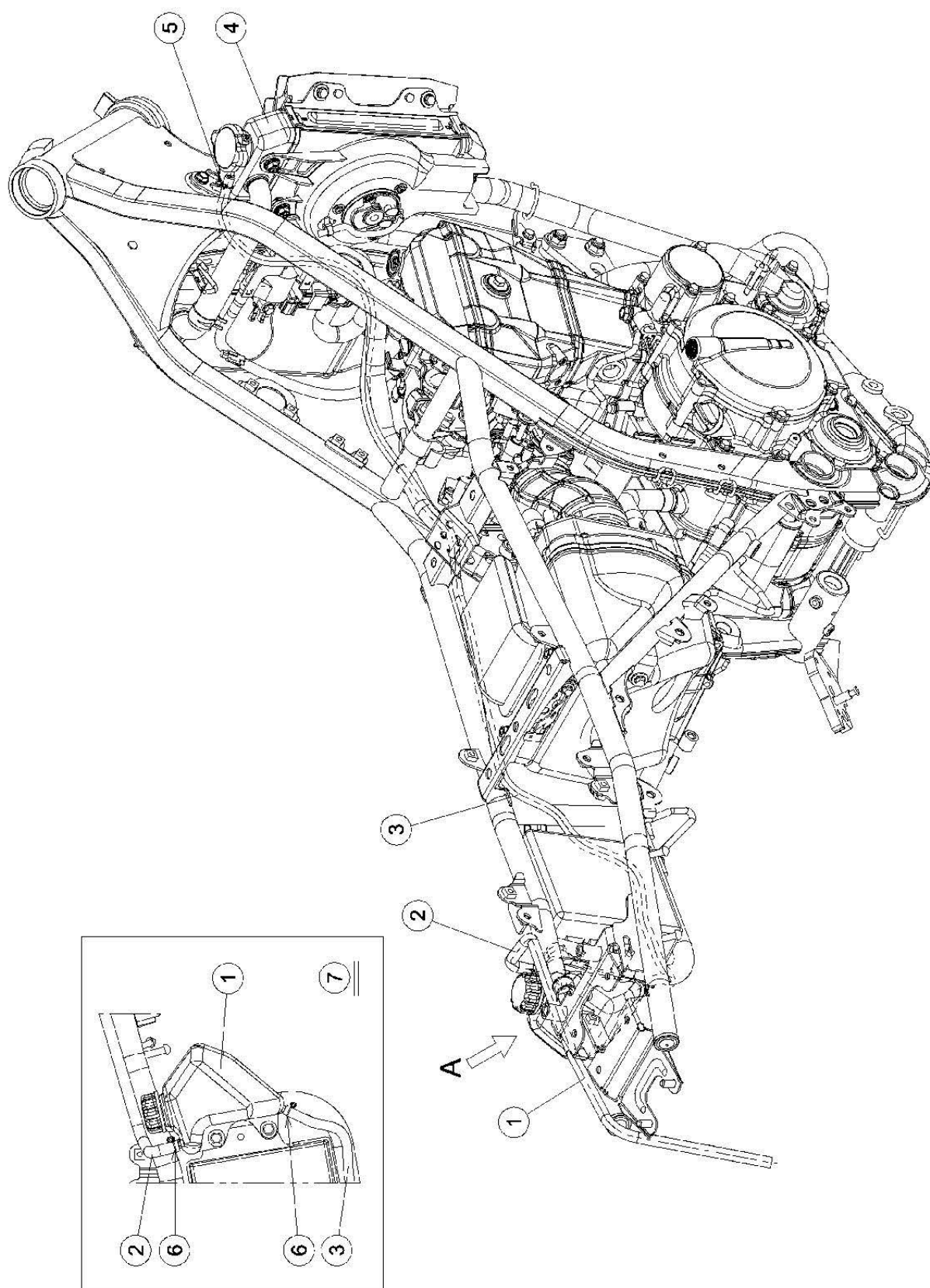


Cable, Wire, and Hose Routing

1. Right Radiator
2. Left Radiator
3. Water Hoses
4. Clamps (Face its clamp screw outward.)
5. Clamp (Hold the water hose.)
6. Check that the clearance between the water hoses is 3.5 mm (0.14 in.).

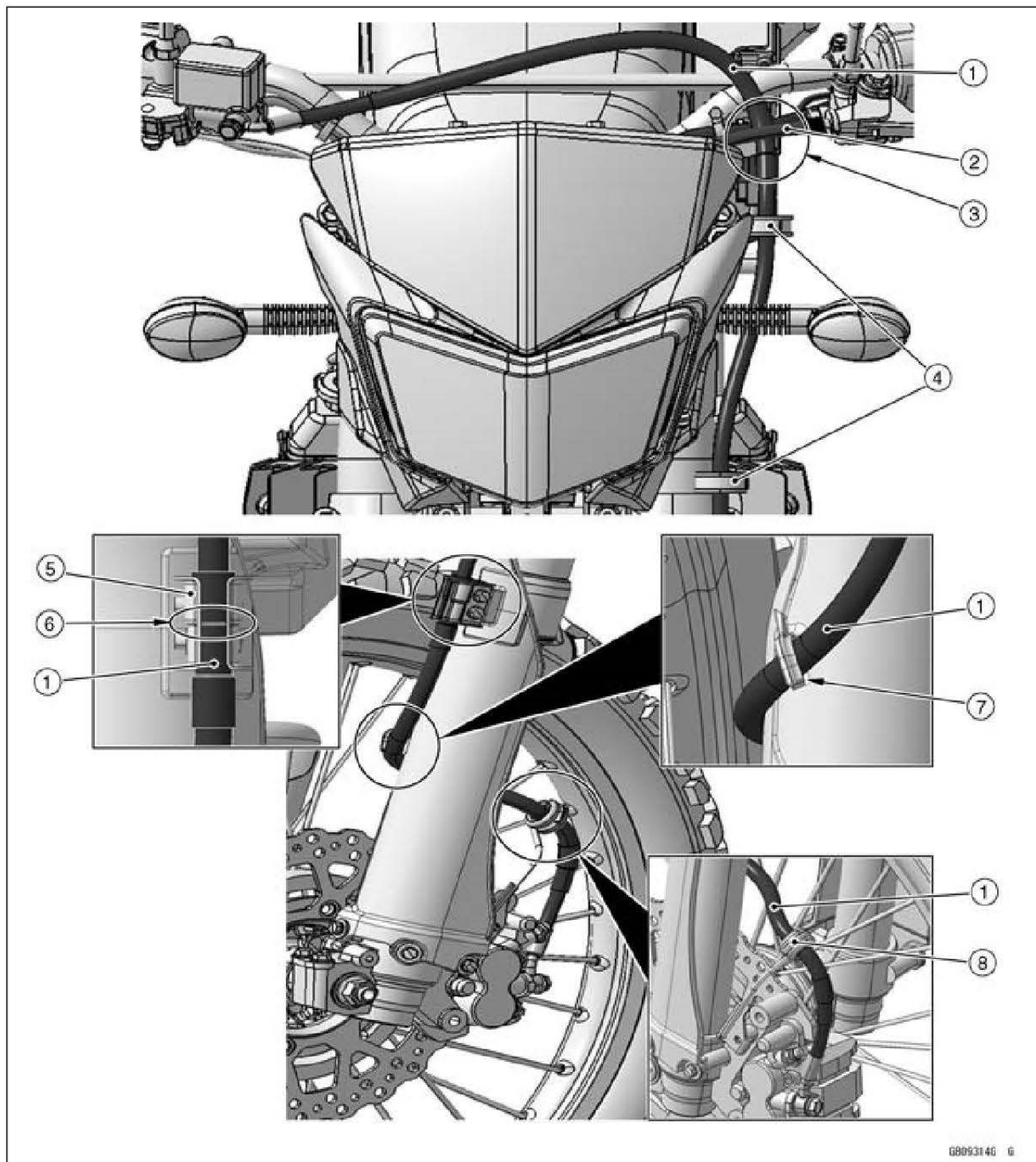
17-42 APPENDIX

Cable, Wire, and Hose Routing



Cable, Wire, and Hose Routing

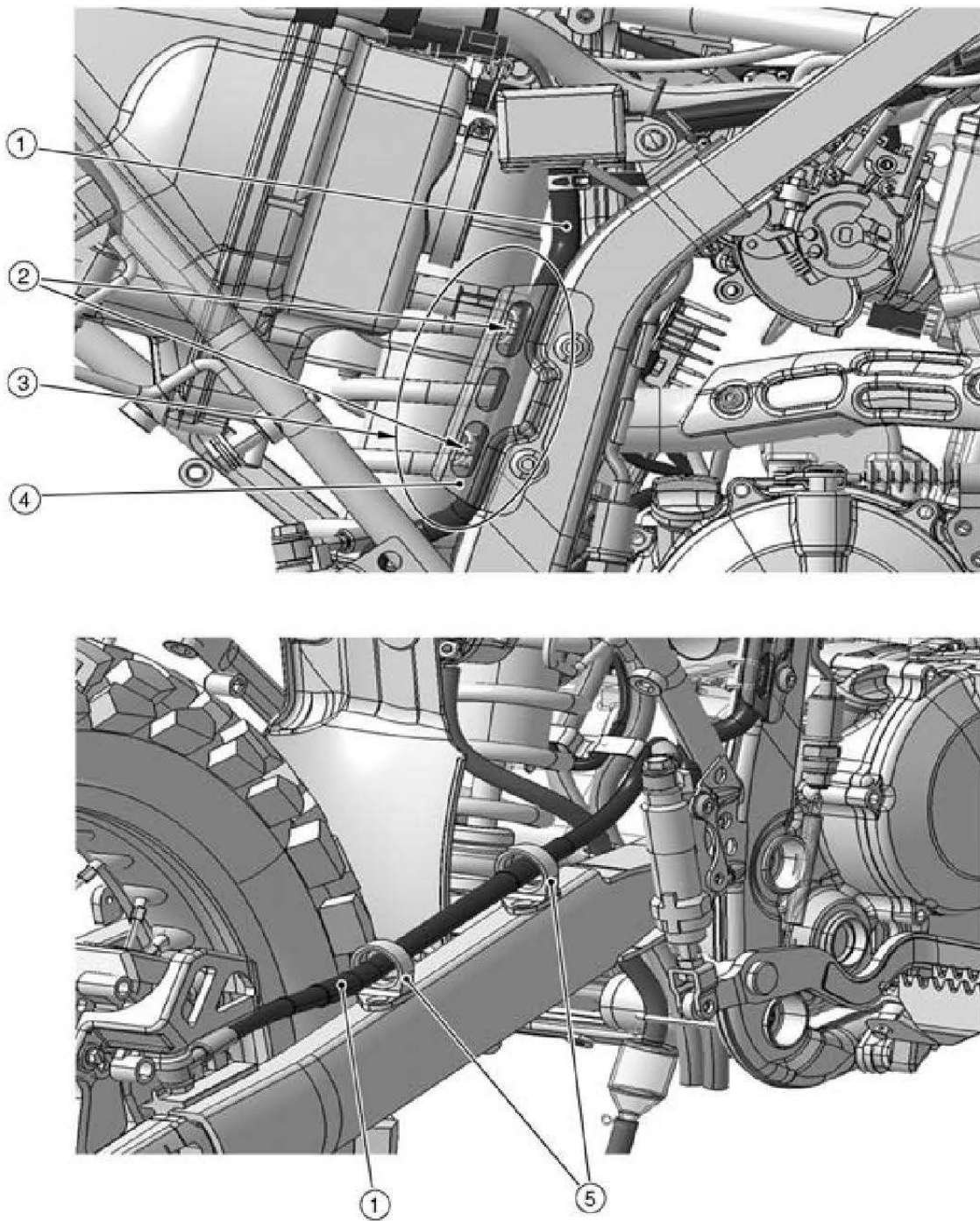
1. Reserve Tank
2. Reserve Tank Overflow Hose
3. Radiator Overflow Hose
4. Radiator
5. Clamp (Face its knob upward.)
6. Clamps (Face its knob backward.)
7. Viewed from A



00093146 6

1. Front Brake Hose
2. Clutch Cable
3. Run the front brake hose to the rear side of the clutch cable.
4. Run the front brake hose through the guides.
5. Clamp (Hold the front brake hose.)
6. The upper step of shrinkable tube must be matching with the step of the clamp.
7. Run the front brake hose through the guide of the front fork protector.
8. Clamp (Hold the front brake hose.)

Cable, Wire, and Hose Routing



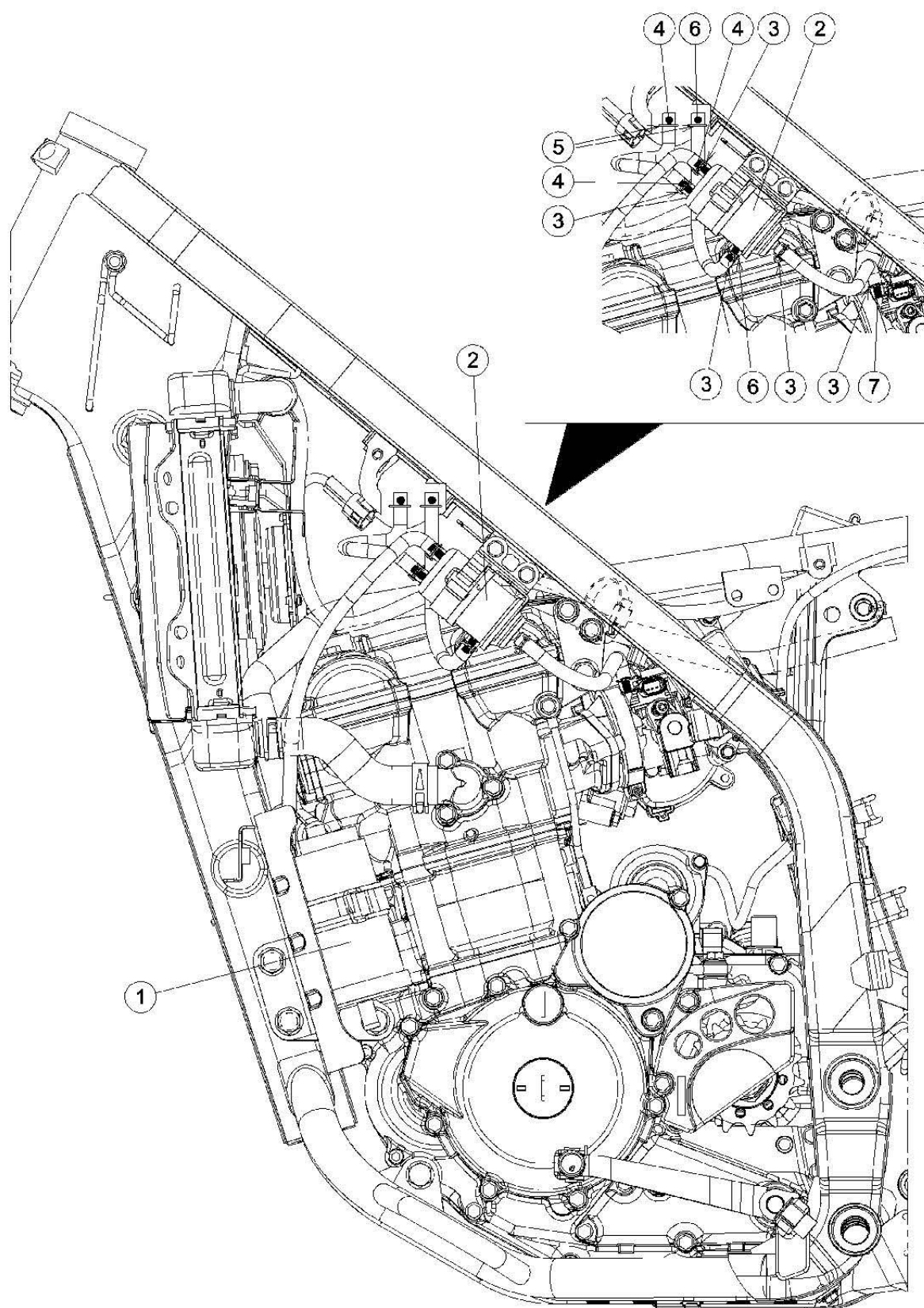
GB090158 G

1. Rear Brake Hose
2. Clamps
3. Run the rear brake hose through the clamps and run it on the rear side of the guard.
4. Guard
5. Clamps (Hold the rear brake hose.)

17-46 APPENDIX

Cable, Wire, and Hose Routing

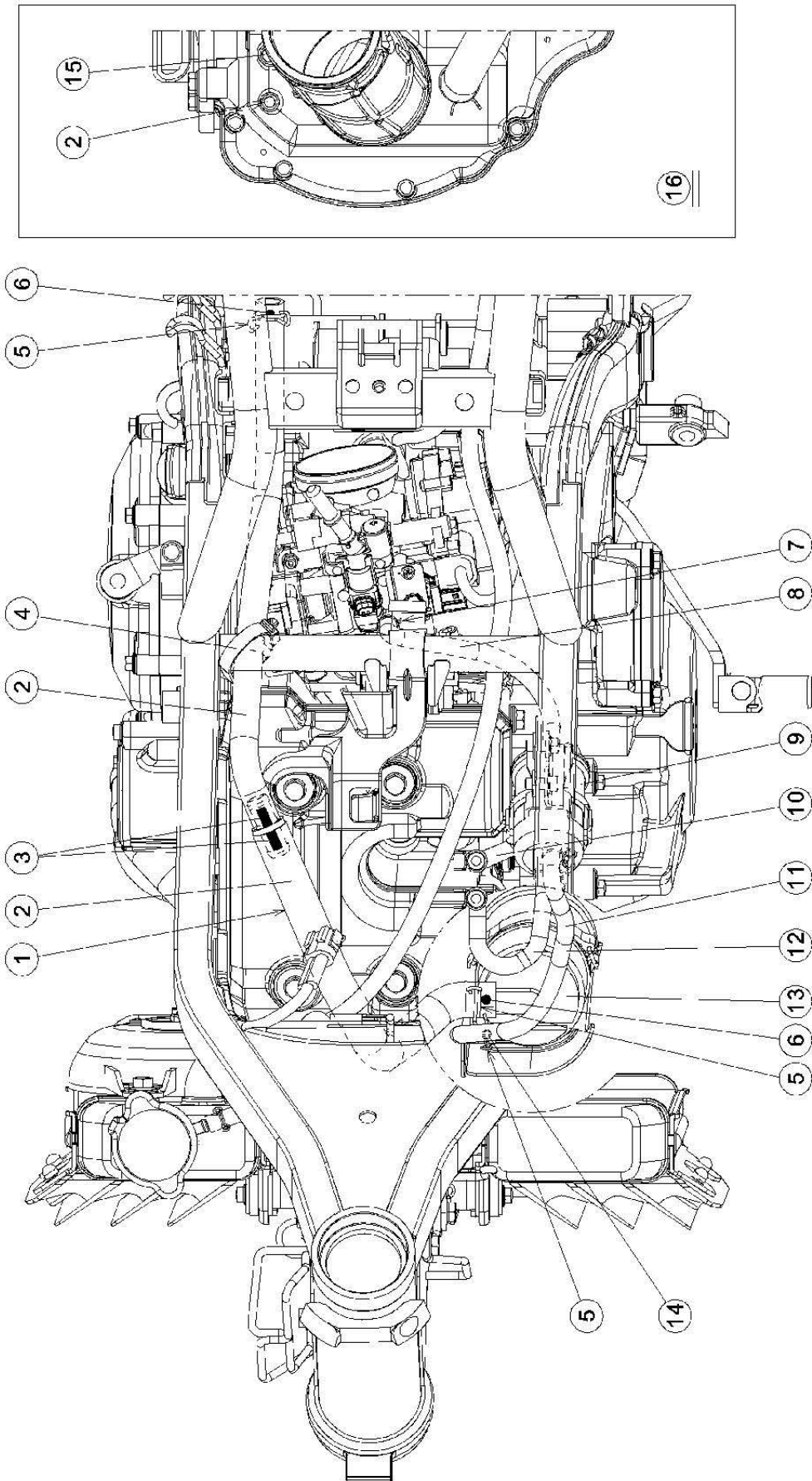
CAL Model



Cable, Wire, and Hose Routing

1. Canister
2. Separator
3. Clamps (Face its knob leftward.)
4. Blue Marks
5. Clamps (Face its knob rightward.)
6. Red Marks
7. White Mark

CAL Model



Cable, Wire, and Hose Routing

1. Do not touch the hose (canister ~ air cleaner) of the cylinder head cover bolts.
2. Hose (Canister ~ Air Cleaner)
3. White Mark
4. Band (Hold the hose (canister ~ air cleaner) and frame pipe.)
5. Clamp (Face its knob upward.)
6. Green Mark
7. Clamp (Face its knob leftward.)
8. Hose (Separator ~ Throttle Body Assy)
9. Separator
10. Fuel Return Hose
11. Hose (Separator ~ Canister)
12. Fuel Tank Breather Hose
13. Canister
14. Blue Mark
15. Air Switching Valve Hose
16. Viewed from Front Side

Troubleshooting Guide

NOTE

- Refer to the *Fuel System (DFI)* chapter for most of DFI trouble shooting guide.
- This is not an exhaustive list, giving every possible cause for each problem listed. It is meant simply as a rough guide to assist the troubleshooting for some of the more common difficulties.

Engine Doesn't Start, Starting Difficulty:

Starter motor not rotating:

- Ignition and engine stop switch not on
- Starter lockout switch or neutral switch trouble
- Starter motor trouble
- Battery voltage low
- Starter relay not contacting or operating
- Starter button not contacting
- Starter circuit relay trouble
- Diode trouble
- Starter system wiring shorted or open
- Ignition switch trouble
- Engine start/stop switch trouble
- Main or ignition fuse blown

Starter motor rotating but engine doesn't turn over:

- Vehicle-down sensor (DFI) coming off
- Starter clutch trouble
- Starter idle gear trouble

Engine won't turn over:

- Valve seizure
- Valve lifter seizure
- Cylinder, piston seizure
- Crankshaft seizure
- Connecting rod small end seizure
- Connecting rod big end seizure
- Transmission gear or bearing seizure
- Camshaft seizure
- Starter idle gear seizure
- Balancer bearing seizure

No fuel flow:

- No fuel in tank
- Fuel pump trouble
- Fuel tank air vent obstructed
- Fuel filter clogged
- Fuel line clogged

No spark; spark weak:

- Vehicle-down sensor (DFI) coming off
- Ignition switch not on
- Engine stop switch turned to stop position
- Clutch lever not pulled in or gear not in neutral
- Battery voltage low
- Spark plug dirty, broken, or gap maladjusted
- Spark plug incorrect

Spark plug cap or high tension lead trouble
Spark plug cap shorted or not in good contact

ECU trouble

Neutral, starter lockout, or side stand switch trouble

Crankshaft sensor trouble

Ignition coil trouble

Ignition switch or engine stop switch shorted

Starter system wiring shorted or open

Main or ignition fuse blown

Fuel/air mixture incorrect:

- Air passage clogged
- Air cleaner clogged, poorly sealed, or missing
- Leak from oil filler cap, crankcase breather hose or air cleaner drain hose.

Compression Low:

- Spark plug loose
- Cylinder head not sufficiently tightened down
- Cylinder, piston worn
- Piston ring bad (worn, weak, broken, or sticking)
- Piston ring/groove clearance excessive
- Cylinder head gasket damaged
- Cylinder head warped
- Valve spring broken or weak
- No valve clearance
- Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface)

Poor Running at Low Speed:

Spark weak:

- Battery voltage low
- Ignition coil trouble
- Spark plug cap shorted or not in good contact
- Spark plug dirty, broken, or maladjusted
- Spark plug cap or high tension lead trouble
- Spark plug incorrect
- ECU trouble
- Crankshaft sensor trouble

Fuel/air mixture incorrect:

- Air passage clogged
- Air cleaner clogged, poorly sealed, or missing
- Fuel tank air vent obstructed
- Fuel pump trouble
- Fuel to injector insufficient
- Fuel line clogged
- Throttle body assy holder loose
- Air cleaner housing holder loose

Compression low:

- Spark plug loose

Troubleshooting Guide

Cylinder head not sufficiently tightened down

No valve clearance

Cylinder, piston worn

Piston ring bad (worn, weak, broken, or sticking)

Piston ring/groove clearance excessive

Cylinder head gasket damaged

Cylinder head warped

Valve spring broken or weak

Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface)

Camshaft cam worn

Run-on (dieseling):

Ignition switch trouble

Engine stop switch trouble

Fuel injector trouble

Other:

ECU trouble

Engine oil viscosity too high

Drive train trouble

Brake dragging

Clutch slipping

Engine overheating

Air suction valve trouble

Air switching valve trouble

Poor Running or No Power at High Speed:

Firing incorrect:

Spark plug dirty, broken, or maladjusted

Spark plug cap or high tension lead trouble

Spark plug incorrect

Spark plug cap shorted or not in good contact trouble

Ignition coil trouble

ECU trouble

Fuel/air mixture incorrect:

Air cleaner clogged, poorly sealed, or missing

Air cleaner housing holder loose

Water or foreign matter in fuel

Throttle body assy holder loose

Fuel to injector insufficient

Fuel tank air vent obstructed

Fuel line clogged

Fuel pump trouble

Compression low:

Spark plug loose

Cylinder head not sufficiently tightened down

No valve clearance

Cylinder, piston worn

Piston ring bad (worn, weak, broken, or sticking)

Piston ring/groove clearance excessive

Cylinder head gasket damaged

Cylinder head warped

Valve spring broken or weak

Valve not seating properly (valve bent, worn, or carbon accumulation on the seating surface.)

Knocking:

Carbon built up in combustion chamber

Fuel poor quality or incorrect

Spark plug incorrect

ECU trouble

Miscellaneous:

Throttle valve won't fully open

Brake dragging

Clutch slipping

Engine overheating

Engine oil level too high

Engine oil viscosity too high

Drive train trouble

Camshaft cam worn

Air suction valve trouble

Air switching valve trouble

Catalytic converter melt down due to muffler overheating (KLEEN)

Overheating:

Firing incorrect:

Spark plug dirty, broken, or maladjusted

Spark plug incorrect

ECU trouble

Muffler overheating:

For KLEEN, do not push-start with a dead battery (Connect another full-charged battery with jumper cables, and start the engine using the electric starter)

For KLEEN, do not start the engine under misfire due to spark plug fouling or poor connection of the stick coil

For KLEEN, do not coast the motorcycle with the ignition switch off (Turn the ignition switch on and run the engine)

ECU trouble

Fuel/air mixture incorrect:

Throttle body assy holder loose

Air cleaner housing holder loose

Air cleaner poorly sealed, or missing

Air cleaner clogged

Compression high:

Carbon built up in combustion chamber

Engine load faulty:

Clutch slipping

Engine oil level too high

Engine oil viscosity too high

Drive train trouble

Brake dragging

Lubrication inadequate:

Engine oil level too low

Troubleshooting Guide

Engine oil poor quality or incorrect

Coolant incorrect:

Coolant level too low

Coolant deteriorated

Wrong coolant mixed ratio

Cooling system component incorrect:

Radiator fin damaged

Radiator clogged

Thermostat trouble

Radiator cap trouble

Radiator fan relay trouble

Fan motor broken

Fan blade damaged

Water pump not turning

Water pump impeller damaged

Over Cooling:

Cooling system component incorrect:

Thermostat trouble

Radiator fan relay trouble

Water temperature sensor broken

Clutch Operation Faulty:

Clutch slipping:

Friction plate worn or warped

Steel plate worn or warped

Clutch spring broken or weak

Clutch hub or housing unevenly worn

No clutch lever play

Clutch inner cable trouble

Clutch release mechanism trouble

Clutch not disengaging properly:

Clutch plate warped or too rough

Clutch spring compression uneven

Engine oil deteriorated

Engine oil viscosity too high

Engine oil level too high

Clutch housing frozen on drive shaft

Clutch hub nut loose

Clutch hub spline damaged

Clutch friction plate installed wrong

Clutch lever play excessive

Clutch release mechanism trouble

Gear Shifting Faulty:

Doesn't go into gear; shift pedal doesn't return:

Clutch not disengaging

Shift fork bent or seized

Gear stuck on the shaft

Gear positioning lever binding

Shift return spring weak or broken

Shift return spring pin loose

Shift mechanism arm spring broken

Shift mechanism arm broken

Jumps out of gear:

Shift fork ear worn, bent

Gear groove worn

Gear dogs and/or dog holes worn

Shift drum groove worn

Gear positioning lever spring weak or broken

Shift fork guide pin worn

Drive shaft, output shaft, and/or gear splines worn

Overshifts:

Gear positioning lever spring weak or broken

Shift mechanism arm spring broken

Abnormal Engine Noise:

Knocking:

ECU trouble

Carbon built up in combustion chamber

Fuel poor quality or incorrect

Spark plug incorrect

Overheating

Piston slap:

Cylinder/piston clearance excessive

Cylinder, piston worn

Connecting rod bent

Piston pin, piston pin hole worn

Valve noise:

Valve clearance incorrect

Valve spring broken or weak

Camshaft bearing worn

Valve lifter worn

Other noise:

Connecting rod small end clearance excessive

Connecting rod big end clearance excessive

Piston ring/groove clearance excessive

Piston ring worn, broken, or stuck

Piston ring groove worn

Piston seizure, damage

Cylinder head gasket leaking

Exhaust pipe leaking at cylinder head connection

Crankshaft runout excessive

Engine mount loose

Crankshaft bearing worn

Primary gear worn or chipped

Camshaft chain tensioner trouble

Camshaft chain, sprocket, guide worn

Air suction valve damaged

Air switching valve damaged

Alternator rotor loose

Catalytic converter melted down due to muffler overheating (KLEEN)

Troubleshooting Guide

Abnormal Drive Train Noise:

Clutch noise:

- Clutch housing/friction plate clearance excessive
- Clutch housing gear worn
- Wrong installation of outside friction plate

Transmission noise:

- Bearings worn
- Transmission gear worn or chipped
- Metal chips jammed in gear teeth
- Engine oil insufficient

Drive line noise:

- Drive chain adjusted improperly
- Drive chain worn
- Rear and/or engine sprocket worn
- Chain lubrication insufficient
- Rear wheel misaligned

Abnormal Frame Noise:

Front fork noise:

- Oil insufficient or too thin
- Spring weak or broken

Rear shock absorber noise:

- Shock absorber damaged

Disc brake noise:

- Pad installed incorrectly
- Pad surface glazed
- Disc warped
- Caliper trouble

Other noise:

- Bracket, nut, bolt, etc. not properly mounted or tightened

Exhaust Smokes Excessively:

White smoke:

- Piston oil ring worn
- Cylinder worn
- Valve oil seal damaged
- Valve guide worn
- Engine oil level too high

Black smoke:

- Air cleaner clogged

Brown smoke:

- Air cleaner housing holder loose
- Air cleaner poorly sealed or missing

Handling and/or Stability Unsatisfactory:

Handlebars hard to turn:

- Cable routing incorrect
- Hose routing incorrect
- Wiring routing incorrect
- Steering stem nut too tight
- Steering stem bearing damaged
- Steering stem bearing lubrication inadequate
- Steering stem bent
- Tire air pressure too low

Handlebars shake or excessively vibrate:

- Tire worn
- Swingarm pivot bearing worn
- Rim warped, or not balanced
- Wheel bearing worn
- Handlebar clamp bolt loose
- Steering stem nut loose
- Front, rear axle runout excessive
- Engine mounting bolt loose

Handlebars pull to one side:

- Frame bent
- Wheel misalignment
- Swingarm bent or twisted
- Swingarm pivot shaft runout excessive
- Steering maladjusted
- Front fork bent
- Right and left front fork oil level improper amount

Shock absorption unsatisfactory:

- (Too hard)
- Front fork oil excessive
- Front fork oil viscosity too high
- Rear shock absorber adjustment too hard
- Tire air pressure too high
- Front fork bent
- (Too soft)
- Tire air pressure too low
- Front fork oil insufficient and/or leaking
- Front fork oil viscosity too low
- Rear shock adjustment too soft
- Front fork, rear shock absorber spring weak
- Rear shock absorber oil leaking

Troubleshooting Guide

Brake Doesn't Hold:

- Air in the brake line
- Pad or disc worn
- Brake fluid leakage
- Disc warped
- Contaminated pad
- Brake fluid deteriorated
- Primary or secondary cup damaged in master cylinder
- Master cylinder scratched inside

Battery Trouble:

Battery discharged:

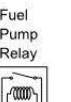
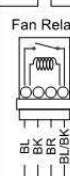
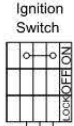
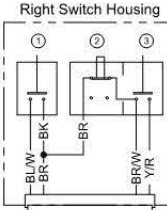
- Charge insufficient
- Battery faulty (too low terminal voltage)
- Battery cable making poor contact
- Load excessive (e.g., bulb of excessive wattage)
- Ignition switch trouble
- Alternator trouble
- Wiring faulty
- Regulator/rectifier trouble

Battery overcharged:

- Alternator trouble
- Regulator/rectifier trouble
- Battery faulty

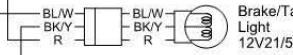
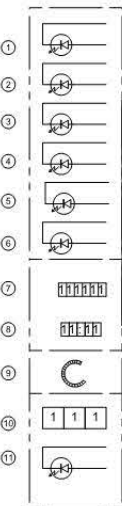
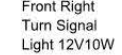
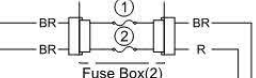
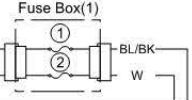
- Meter Unit
1.Green Turn Signal Indicator Light (LED)
2.Blue High Beam Indicator Light (LED)
3.Green Neutral Indicator Light (LED)
4.Red Coolant Temperature Warning Indicator Light (LED)
5.Yellow Engine Warning Indicator light (LED)
6.Amber Fuel Level Warning Indicator Light (LED)
7.Multifunction Display
8.Clock
9.Tachometer
10.Speedometer
11.Illumination Light (LED)
※ LED:Light Emitting Diode

- Right Switch Housing
1. Front Brake Light Switch
2. Engine Stop Switch
3. Starter Button

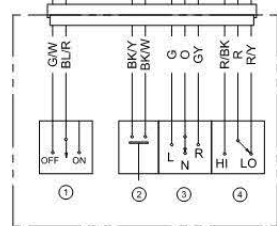


- Fuse Box(1)
1.Radiator Fan Fuse 10A
2.ECU Fuse 15A

- Fuse Box(2)
1.Ignition Fuse 10A
2.Lighting System Fuse 10A



- Left Switch Housing
1.Starter Lockout Switch
2.Horn Button
3.Turn Signal Switch
4.Dimmer Switch



LEFT SWITCH HOUSING CONNECTIONS												
Starter Lockout Switch			Horn Button		Turn Signal Switch				Dimmer Switch			
Color	G/W	BL/R	Color	BK/Y/BK/W	Color	G	O	GY		R/BK	R	R/Y
ON			Push		L				HI			
OFF			Released		OFF(Push)				LO			
					R							

IGNITION SWITCH CONNECTIONS		
	W	BR
OFF(LOCK)		
ON		

RIGHT SWITCH HOUSING CONNECTIONS							
Front Brake Light Switch		Engine Stop Switch			Starter Button		
	BK	BL/W		BR	BR/W	Y/R	BR/W
Brake Lever			OFF				
Pulled In						Push	
			RUN				

Side Stand Switch		
	G	BK
UP		
DOWN		

Color Code	
BK	Black
BL	Blue
BR	Brown
G	Green
GY	Gray
LB	Light Blue
LG	Light Green
O	Orange
P	Pink
PU	Purple
R	Red
W	White
Y	Yellow

(Connect in the Switch housing)

(98052-1564A)



MODEL APPLICATION

□: This digit in the frame number changes from one machine to another.

Year	Model	Beginning Frame No.
2021	KLX300DM	ML5LXBD1□MDA00001
2021	KLX300EM	ML5LXBE1□MDA00001